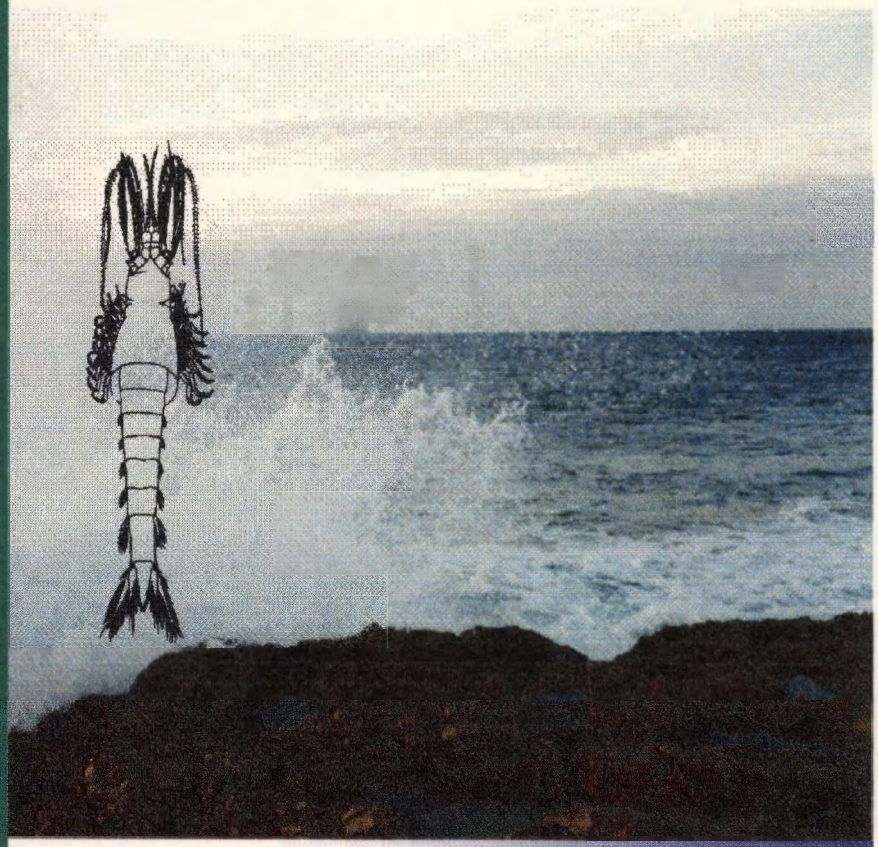
MYSIDLAN 4.0

Manual (draft)



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6449

MYSIDLAN 4.0
Manual (Draft)

This manual was created by Tim Deprez. It gives a brief overview of the main features of the taxonomy software Mysidlan 4.0.

A first review of the manual was done by Dr Ward Vanden Berghe (VLIZ).

The software Mysidlan 4.0 was developed by Saudades during 1999-2000.

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A. Use

1. GETTING STARTED

The application Mysidlan can be started in different ways. After installing the application it can be started from the 'Programs' folder of the start menu. It can also be started from your desktop, where the application is represented by an icon that is shown in Figure 1:

Figure 1. Illustration of start-up icon for Mysidlan

After starting up the application a username and password have to be filled in.

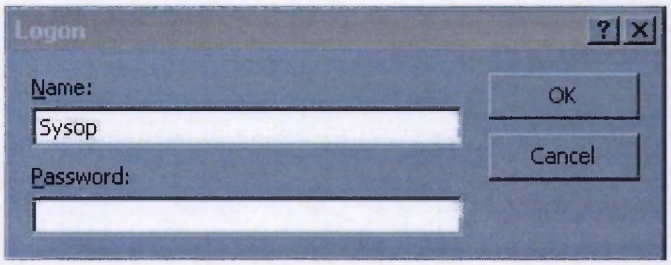


Figure 2. Illustration of the start-up form

After clicking 'OK' the application continues to load; a menu is displayed at the top of the screen. The next parts of this chapter will explain the different actions and possibilities.

A representation of the menu is given in the table below; navigating through the manual is possible by clicking on the different menu items in this table.

File	Data	Reporting	System	Help
Open Data	Editing	Printtree	Maintenance	Manual
Close Data	Documents		System	About
Exit	Search		Tables	
	Quicksearch		Logs	

Table 1. Main toolbar in the Mysidlan application

The help option from the menu has two active items: 'Manual', which opens the manual in Acrobat Reader and 'About', which gives the program information

2. FILE

This menu is the main key to enter the data. There are three possible choices in this menu: 'Open Data', 'Close Data' and 'Exit'.

2.1 Open Data

This action has to be done each time after the data has been closed and you want to open and work on a data file. After having chosen this option the following dialog box is shown:

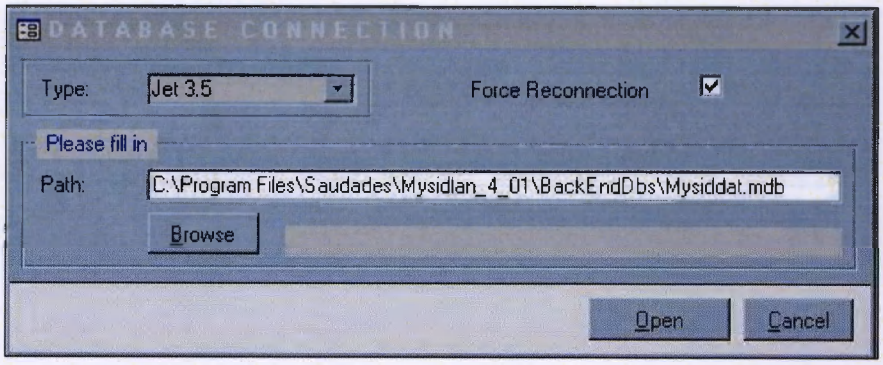


Figure 3. Example of the dialog box to open a data file

In the field path the location of the data file has to be filled in. It is possible to navigate through the different folders with the button 'Browse'. After having filled in the right location click the 'Open' button. In this way, the data will be loaded and editing and manipulating the data will be possible.

2.2 Close Data

After editing a data set, and before opening another one, the current data set has to be closed. This is possible by choosing the option 'Close data' from the file menu.

2.3 Exit

The exit option in the file menu is used to quit the application Mysidlan. Data is automatically stored.

3. DATA

In the main menu the second option is the one on data. It is used to access the three main ways of using the data.

- Editing the data on the different taxonomic levels is possible in the option 'Editing'
- Editing the documents with the links to the scanned articles is possible in the option 'Documents'.
- Searching through the database is possible in the option 'Search'.

The three different options will be discussed in depth in following chapters. Examples and screen captures will be used to illustrate the possible actions. Links to practical information on different menus will be added too.

3.1 Editing general explanation

After choosing this option, a window is opened with the classification tree. This tree can be edited on the different levels. The genus, species and record level can contain links to documents. In the record level input of other data is also possible.
A brief summary of the purposes of this form:

1. To input and edit the taxonomic tree
2. To create measurement records under species nodes
3. To store diverse sets of morphological, biogeographical and ecological information about specimens in records
4. To link some types of nodes to an electronic version of the publication from which the information was extracted

This section contains information on the following topics:

- Adding nodes to the tree
- Navigating the tree
- Genus nodes
- Species nodes
- Record nodes

In the following part different possible actions are described in detail. Each time, the actions are indicated by the following symbol: 🛠.

3.1.1 Classification tree

The classification tree is the central part of the data set. It is the switchboard to which all the other data is linked. The classification tree contains different levels referring to the most up-to-date classification. All possible levels are shown in table 1.

Tree levels
Kingdom
Phylum
Class
Subclass
Superorder
Order
Suborder
Superfamily
Family
Subfamily
Tribe
Genus
Species
Record

Table 2. List of levels in the classification tree

Possible actions on the tree are explained below.

3.1.1.1 Adding items to the tree

It is possible to add items on different levels in the tree. Only taxonomically valid additions are allowed, e.g. it is not possible to include a family level under a genus level item.

Adding an item in the tree is done by moving the mouse pointer to the insertion point. A right mouse click brings up a menu where the option 'Insert Item' can be chosen. In the dialog box shown in figure 1, the level of the new item has to be filled in, as well as a description, which is mostly the name of the added level.

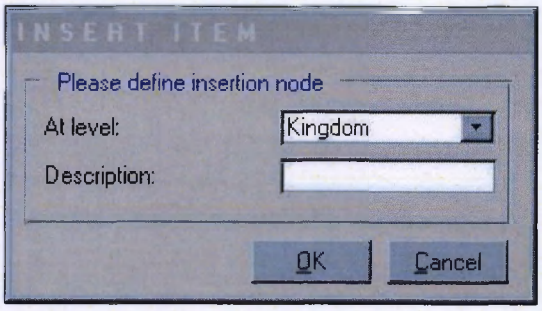


Figure 4. Dialog box for inserting an item in the classification tree

Example: The user wants to insert a new family in the order of the Mysida. First he has to move the mouse pointer to the name Mysida and right-click on this item. Then he has to choose the option 'insert Item'. As level name he must choose 'family', as description the name of the family, e.g. Leptomysidae.

3.1.1.2 Navigation in the tree

Navigation in the tree can be done by moving the scrollbar on the right-hand side of the form. There is a possibility to navigate on different levels in the tree. Therefore different levels in the tree can be expanded or collapsed.
Levels above the genus level which are collapsed are indicated by a '+'-symbol before the name of the item. If expanded a '-'-symbol is shown.
On genus level the indications are a bit different:

- Genera that contain no species (at present) are preceded by
- Genera containing one or more species are preceded by if collapsed and if expanded

When a taxon name is highlighted, an overview of its classification level is shown in the status bar (example on page 74) at the base of the screen. At species level, this classification list is preceded by species name and naming source.

The tree can also be expanded and collapsed with a right mouse click. Again, a menu (example on page 73) is given where the option 'Refresh tree' can be chosen. In the dialog box, the right commands have to be filled in, according to the wishes of expansion of tree.

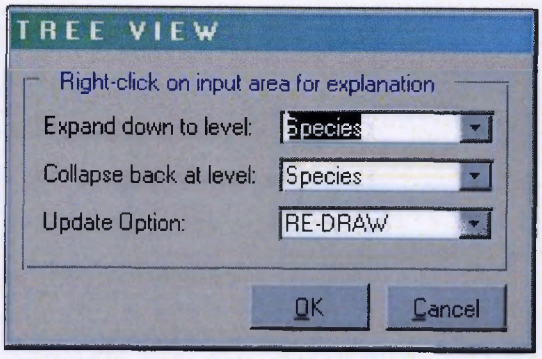


Figure 5. Illustration of the dialog box for collapsing and expanding the classification tree

In the input field of 'expand down to level' the level to which the tree must be expanded, is filled in.
In the input field of 'Collapse back at level' the level to which the tree must be collapsed, is filled in. This function always starts from the expansion of tree at the moment this function is started.
Both fields can be set at the same value. This most often gives the best results. In the input field 'Update Option', there is a choice between 'refill' and 'redraw'. The 'redraw' choice completely regenerates the tree. The 'refill' choice just fills in the levels not displayed at that moment.

3.1.2 Genus level

On the classification level 'genus' in the tree, a tab with the name 'links' is appearing next to the classification tab. This tab can be made visible by first clicking on the genus name itself and afterwards on the link tab at the top of the form. More detailed information will be given in another part where every field of this tab will be explained.

Go to detailed information on genus link on page 19.

Example of the tab on page 72.

3.1.3 Species level

On the classification level 'Species' in the tree, a tab with the name 'links' is appearing next to the classification tab. This tab can be made visible by first clicking on the species name itself and afterwards on the link tab at the top of the form. More detailed information will be given in another part where every field of this tab will be explained.

Go to detailed information on species link on page 20.

Example of the tab on page 72.

3.1.4 Record level

Under the species level there is also a possibility to add different records. These records refer to different reports of the species linked to documents from where the data was taken. In these record levels there appear a lot more tabs in which information found in the source referred to in the links tab, can be added. This information is morphological, ecological and geographical.
More detailed information will be given in another part where every field of this tab will be explained.

Go to detailed information on record link on page 21.

3.2 Mysidacea detailed explanation on the links

3.2.1 Genus – Level

3.2.1.1 General

On 'genus' level, there is the possibility to add an information source in the tab 'links'. This source is described as a bibliographic link with different classical parts of a bibliographic description. These biogeographical data can be added in the part 'Documents', which can be opened in the main menu bar in the part 'data'. More precise information on managing the document database is given in the part on documents (page 25).
The tab 'links' links a document with its unique identification number (ID-number) to a genus in the tree. A document can only be linked to one specific genus. The document mostly contains the description of the genus or basic information on the genus.

See example of the tab on page 72.

3.2.1.2 Explanation of the different fields

In this tab different buttons and fields are present, which need some more explanation.

3.2.1.2.1 Document

This field contains the unique ID number of the document. By typing the number or by scrolling through the list (example of the scroll list on page 74) of documents and choosing a document of the list, a link is created between the genus and the document. The fields with the bibliographic data are automatically updated with the information on the chosen document.

Scrolling is possible by clicking the arrow, which appears when the cursor is moved over the 'documents' field.

It is usually easier to search first in the document database for the correct ID-number with the search options included there and remember this number and then fill it in manually.

3.2.1.2.2 Naming Usage

This field gives some more information on the type of information that is in the document referred to. Mostly in the genus this is informative. This means that the article just gives information on the genus.

3.2.1.2.3 Edit-button

Using this option, it becomes possible to edit the document information in the document database itself. Sometimes this is useful when a certain document is already linked to another level (genus, species or record). This is visible because a genus or species name that does not fit with the genus to which the document has to be linked appears, in the field 'link'.

Solving this problem can be done by cloning the document in the document database and thus creating a new unique ID number for the document.

3.2.1.2.4 View-button

This button is one of the most powerful tools of Mysidlan. By clicking this button a view of the scanned document is given in PDF-format. This document shows the full article or the scanned part as it has been scanned and is completely full text searchable.

See example of scanned document on page 76.

3.2.2 Species – Level

3.2.2.1 General

On the level 'species' in the tree, there is, as with the genus level, the possibility to define a link with a document. These documents are quite important concerning the naming of the species.
The author and the description are automatically generated out of the linked document that is chosen as naming source. The documents themselves can be edited in the part on documents (see page 25).
The tab 'links' links a document with an own unique identification number (ID number) to a certain species in the tree. A document can only be linked to one specific species, genus or record.

See example of the tab on page 72.

3.2.2.2 Explanation of the different fields

In this tab different buttons and fields are present, which need some more explanation.
The way of linking documents to species is the same as stated in the chapter on 'Genus'.
The buttons described in that chapter are the same for the 'Species' node.

3.2.2.2.1 Naming Usage

This field gives some more information on the type of information stored in the document.
There are different possibilities:

- *Original naming source:* The original description of the species
- *Actual naming source:* A more recent description in which the recent naming has been proposed
- *Informative:* Other data mostly not of taxonomically valuable

3.2.3 Record – Level

3.2.3.1 General

The record level is a non-taxonomic level in the tree. It is used as a tool to enter data from different articles, reports or other sources in a standardised way. The data in all the visible tabs is always taken from the document to which the record is linked.
This data is subdivided in a couple of tabs, which will be described more in detail below. In each example of the tab, there is a link to the real descriptive part concerning the choices in the different input fields.
A list of the different tabs is shown in Table 3.

Tab-names
Occurrence
Head
Thorax
Abdomen1
Abdomen2
Remarks
Links

Table 3. List of the tabs in the 'editing' form

There are four types of fields in the different tabs: numerical fields, listbox fields in which just one choice out of a list of values is possible, multiple choice boxes in which different values out of the list can be added and memo fields in which text can be added.
The –3 value is the default value in the numerical fields. 'NA' is the default value for the other types of fields.

3.2.3.2 Occurrence

In this tab some general information on the species occurrence can be added. Depth, longitude and latitude are added in numerical fields; the geographical area and the habitat information are multiple choice boxes.

For more information on the values in the fields: use the links to the chapters on occurrence ...

- Depth
- Longitude & Latitude
- Geographic area
- Biotope

See example of the occurrence tab on page 77.

N.B. The values available in the multiple-choice boxes can be changed in the menu-item 'System–Tables' (see page 68).

3.2.3.3 Head

This tab is mainly used for input of information on some major units on the head. Apart from this, there are also some fields for input of morphometric data.
The morphometric fields are numerical fields. The three fields on the morphology of the head are multiple-choice boxes.

For more information on the values in the fields: use the links to the chapters on Morphometry and Head …

- Male total length
- Male standard length
- Female total length
- Female standard length
- Eyes
- Antennal scale
- Mouth part

See example on the 'Head' tab on page 78.

N.B. The values available in the multiple-choice boxes can be changed in the menu-item 'System–Tables' (see page 68).

3.2.3.4 Thorax

This tab is mainly used for input of information on major units on the thorax. On the tab there are numerical fields, one listbox and two multiple-choice fields

For more information on the values in the fields: use the links to the chapters on Morphometry and Thorax …

- Length carapace
- Pairs of marsupial lamellae
- Carapace
- Thoracopod

See example of the thorax tab on page 78.

N.B. The values available in the multiple-choice boxes and the listboxes can be changed in the menu-item 'System–Tables' (see page 68).

3.2.3.5 Abdomen1

This tab gives the opportunity to input data on the pleopods. Each pleopod of the female and the male has four input fields. The four fields are all listboxes in which just one choice of a value can be made.
Each pleopod has a field on rami, number of endopods, number of exopods and morphological features.

More information on the values in the fields can be found in the chapter on Pleopods …

See example of the Abdomen1 tab on page 79.

N.B. The values available in the multiple-choice boxes can be changed in the menu-item 'System–Tables' (see page 68).

3.2.3.6 Abdomen2

This tab is used for input of data on the last segment of the abdomen. The form is split up in a right side and a left side. The fields on the left side contain information on the uropods while these on the right side contain information on the telson.

For more information on the values in the fields: use the links to the chapters on Abdomen morphology …

- Statocyst
- Number spines exopod
- Number spines endopod
- Uropods
- Telson
- Number spines telson
- Number spinules telson
- Length ratio Telson

See example of Abdomen 2 tab on page 79.

N.B. The values available in the multiple-choice boxes can be changed in the menu-item 'System –Tables'(see page 68).

3.2.3.7 Remarks

This tab is an additional tab in which remarks on the record can be added. These remarks mostly refer to the other tabs. It is possible to ''use a pre-defined template in which the names of the other tabs are available.

Right-clicking the input field will bring up the shortcut menu shown in the figure below.

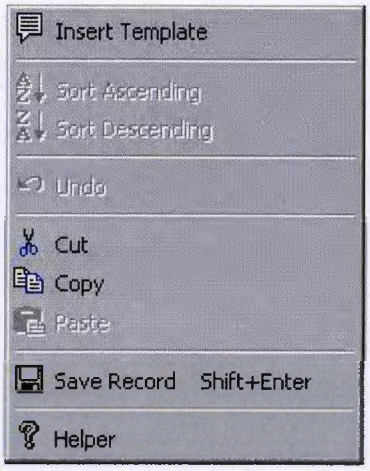


Figure 6. Illustration of the menu

Choose the 'insert template' option and the template is automatically added in the 'remarks' field.

See example of the 'remarks' tab without template on page 80.
See example of the 'remarks' tab with template on page 80.

3.2.3.8 Links

This tab is the one used to link the document, from which the data for the other tabs is taken, to the record. Again, each document has a unique ID-number, which links the document to the record.

See example of links tab on page 73.

Linking documents to the records is mainly the same as stated in the chapter on 'Genus'. The buttons on the tab cause the same actions as described in that chapter.

3.2.3.8.1 Naming Usage

This field gives some more information on the type of information that is stored in the document. There are different possibilities:

- *Data source:* The original data source from which the data for the tabs has been taken.
- *Informative:* Other data except for the data source.

3.3 Documents

All the bibliographic data is stored in a separate document database, which can be accessed without having to close the main database with taxonomic information. Nodes from the main, taxonomic database are linked to documents, to indicate the origin of the information. The following part will discuss how the database is used.

See example of the form on page 81.

3.3.1 Explanation of the fields

As seen in the table below or in the Mysidlan itself, the form consists of several editable fields and a number of buttons. The fields and buttons are organised in functional groups, separated from each other by a box.
A list of the different fields can be found in Table 4. Buttons are indicated in dark grey.

Field or button names
ID
Type
Specifications
Title
Author
Journal
Locality
Electronic document relative to path
Hyperlink
Visual
Edit
View
Physical document
Call nr
Statusbar
Delete
Clone
Close
Navigation bar

Table 4. Overview of different buttons and fields in the documents form

3.3.2 Detailed explanation

3.3.2.1 ID

This field stores a number, assigned automatically by the software to each record the moment it is added to the database. This number is unique for each document, and is the one used for linking the documents to a genus, species or record.

When a record in the document database is deleted, the ID number of this document is automatically deleted too and won't be used again later on. So, every number is generated just once.

3.3.2.2 Type

This field gives an indication on what type of data is stored in the record. There are different types to chose from, which are given in the table. In the Mysidacea-database the 'description' value is most common.

Type	Explanation
Description	Text document of an original article.
Drawing	Drawings on the species, without any text.
Other	Other types than specified in the list.
Paper	
Photo LM	Light microscopy photo.
Photo SEM	Scanning electron microscopy photo
Report	Report of e.g. a meeting on a group of species
Slide	Slide used for a meeting.
Video	Video material of e.g. the movement, a speech
Sound	e.g. a recording of a speech
Unpubl. Data	Own data that has not been published yet.

Table 5. Overview of document types in the 'type' field

3.3.2.3 Specifications

These fields contain bibliographic information on the document. In this way it is easier to search for certain documents.

3.3.2.3.1 Title

Gives the title of the document. In most cases this is the title of a book or an article. It is given as on the publication, without translations or abbreviations.
When the document type does not refer to an article or book or something with an existing title, the general information on the document can be added in this field.

3.3.2.3.2 Author

This field gives the name of the author(s). The names are always given in the same way:

- One author: xxxxx, y. where xxxxx is the surname and y are the initials. E.g. Panampunnayil, S.U.
- Two or more authors: xxxxx, y. & xxxxx, y. & xxxxx, y. where xxxxx and y are as defined above.
  E.g. Greenwood, J.G. &Hadley, D.J.

3.3.2.3.3 Journal

This field contains the title of the journal in which the physical article appeared, together with volume, issue number (if known) and pagination. No abbreviations are used for the journal title. The field is always build up in the same way: xxxxxxxxxxxxxxxxxxxxxx 88 (9): 1111-2222
In this, x gives the complete name of the journal or book, 88 gives the volume number of the periodical when referring to an article, 9 gives the issue number in the volume, 1111 gives the start page and 2222 gives the end page of the article.
Examples:

- Journal of Plankton Research 15: 1141-1148
- Mahasagar 14 (3): 207-209
- Cambridge University press volume XXVII: 289-299

3.3.2.3.4 Locality

This is a field, which gives an indication on the place the article is about. This is NOT the publication location.
E.g. when an article is published in London and is about Mysids of South Africa than in the field South Africa and not London is added.

3.3.2.4 Electronic document relative to path ...

These are two fields of which just one can be edited. These two fields give the location and linking information for the electronic document.
In the title of the box the path is given where all the electronic documents must be stored. This path can be changed in system – maintenance – Hyperlink Base (see page 63).

3.3.2.4.1 Hyperlink

This field is used to store the name of the electronic document. The name of the file is always between '##' Additional information before the file name can also be added manually or automatically. It is this information which will be visible in the Mysidacea database. When there is no additional information added, the file name is displayed.
The filename itself can be typed manually (with a bigger chance for mistakes) or can be added with the edit-button.
Additional information can be added automatically when a document is linked to a genus, species or record. When the document was not yet linked then automatically the genus name or the species name will be added. Confirmation for this will be asked. When the documents in the tree are linked in this way, it is possible to see if a document was already linked to a certain object (genus, species or record). It is also easier to see if the document has to be cloned to create unique document links.

Example:

Hyperlink	Visual
#M1184#	M1184
Leptomysis#M1184#	Leptomysis
Gastrosaccus olivae#M1184#	Gastrosaccus olivae

Table 6. Illustration of link between hyperlink information and the visual part of information

3.3.2.4.2 Visual

This field shows what will be visible in the Mysidacea database. This depends on the link of the document with the genus, species or record.

3.3.2.4.3 Edit

This button gives the possibility to add an electronic document to a record in the document database. By pressing the button, a form is opened in which the file can be chosen. It automatically opens the path indicated in the rectangle surrounding these 'hyperlink' fields. This path can be changed in system – maintenance – Hyperlink Base (see page 63).

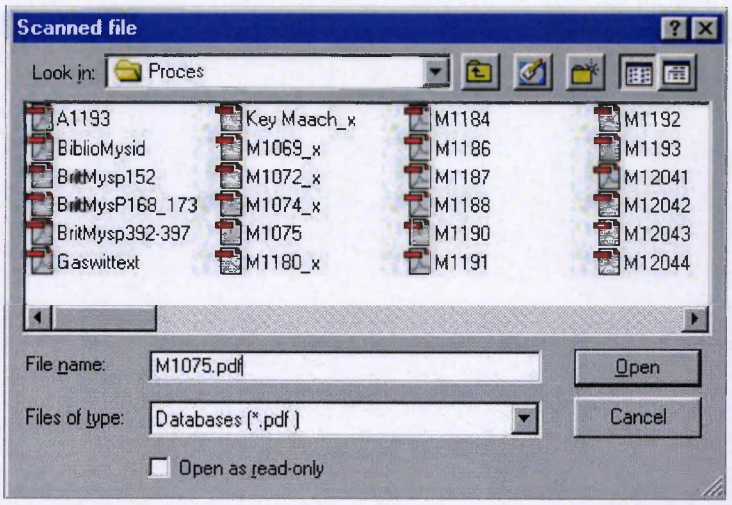


Figure 7. Illustration of the form used for choosing the file that has to be linked to a certain record

The document can be chosen by single left clicking on the file name and then pressing the 'open'-button or by double left clicking the filename.

3.3.2.4.4 View

This button is used to open the electronic document and to watch it on screen. Depending on the extension of the document, the according and present application will be opened to show the chosen file.
Examples:

- M1187.pdf will be opened in e.g. Acrobat viewer.
- Leptomysis.doc will be opened in Microsoft word.
- List.txt will be opened in Wordpad or Write.
- Photo.tif , xxxx.jpg, yyy.bmp, … will be opened in a graphic application such as Paintshop, Corel Draw, …

3.3.2.5 Physical document

This group has just one field with information, which can be added to the record.

3.3.2.5.1 Call nr

The call number gives an indication of the place where the document can be found in a certain library. This library can be a personal or a general library. In this application call numbers of the Marine Library of the University of Ghent Section Marine Biology are used.

3.3.2.6 Status bar

This is the one-but-lowest bar of the form. It contains three buttons, which are explained below.

3.3.2.6.1 Delete

🛠 By pressing this button, the current record will be deleted. Conformation for this action is asked before it is executed. The ID number (see page 25) is also deleted and won't be used again in later made new records in the document database. There is no possibility to 'undo' the 'delete' action.

3.3.2.6.2 Clone

🛠 This button is very useful to link unique document links with objects of the tree. When there is already a link with a certain document in the tree, a new record has to be made to create the unique link with another object in the tree.
Pressing this button automatically creates a new record with a new ID-number with the same information in the different fields as the original document. In the title field the ID number of the original document is added. The different fields can be edited.

3.3.2.6.3 Close

🛠 Pressing this button closes the documents database. Every change is automatically saved.

3.3.2.7 Navigation bar

The arrows on the bar can be used to navigate through the document database. The bar is illustrated in Figure 8. The different buttons are explained in Table 7.

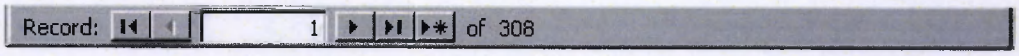


Figure 8. Illustration of the navigation bar

Buttons	Explanation
	Go to first record
	Go to former record
1	N° of current record
	Go to next record
	Go to last record
	New record
of 308	Total number of records

Table 7. Explanation of the different buttons and fields in the navigation bar

3.4 Search

3.4.1 Introduction

The search tool included in the database system Mysidlan is one of the most powerful tools of this application. Its greatest strength is the wide variety of search actions that can be defined, and the degree of control the user has. The Search is built in such a way that searching on any item is possible, that output of any item is possible and that ordering on any item is possible. Specifying a search can be done manually for users who have experience with SQL (**S**tructured **Q**uery **L**anguage), or by using the query builder.

3.4.2 Global overview

The Search-tool can be accessed by clicking Search in the menu under data in the main menu bar.

A global view of the construction of the Search-tool is given in Figure 9.

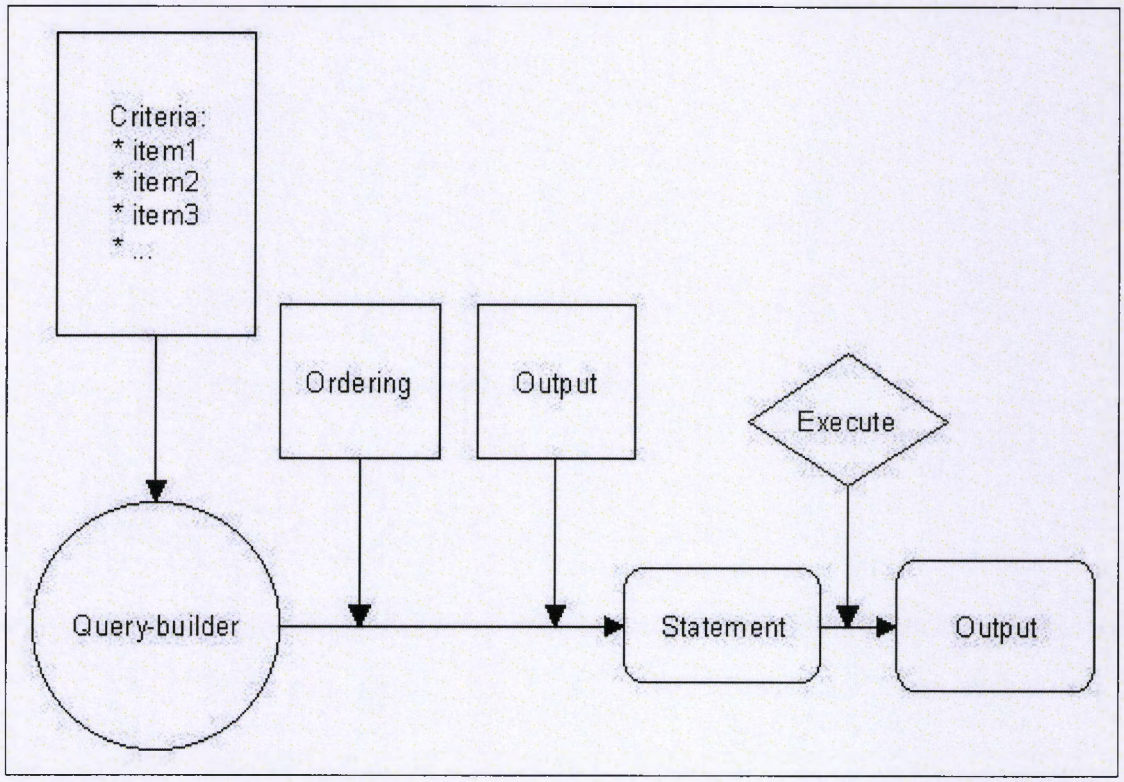


Figure 9. Overview of the working of the Search-tool in Mysidlan.

The next part will explain all details of the Search.

3.4.3 Detailed explanation of the different parts

3.4.3.1 Query

The top part of the Search form contains a box titled 'Query', in which some surrounding properties for the Query can be defined.

Figure 10. View of the upper part of the Search form.

The function of the items seen in Figure 10 is explained below:

3.4.3.1.1 Name

In this field, a name for the query can be given, so it can be saved and be used later on. If you want to open a saved query, click the button in this field to open a list of the saved queries; click the query and select it. When clicking the button/icon at the right side of the 'name' field, the 'General Selection Form' is opened. Use this form to search for queries with certain characteristics:

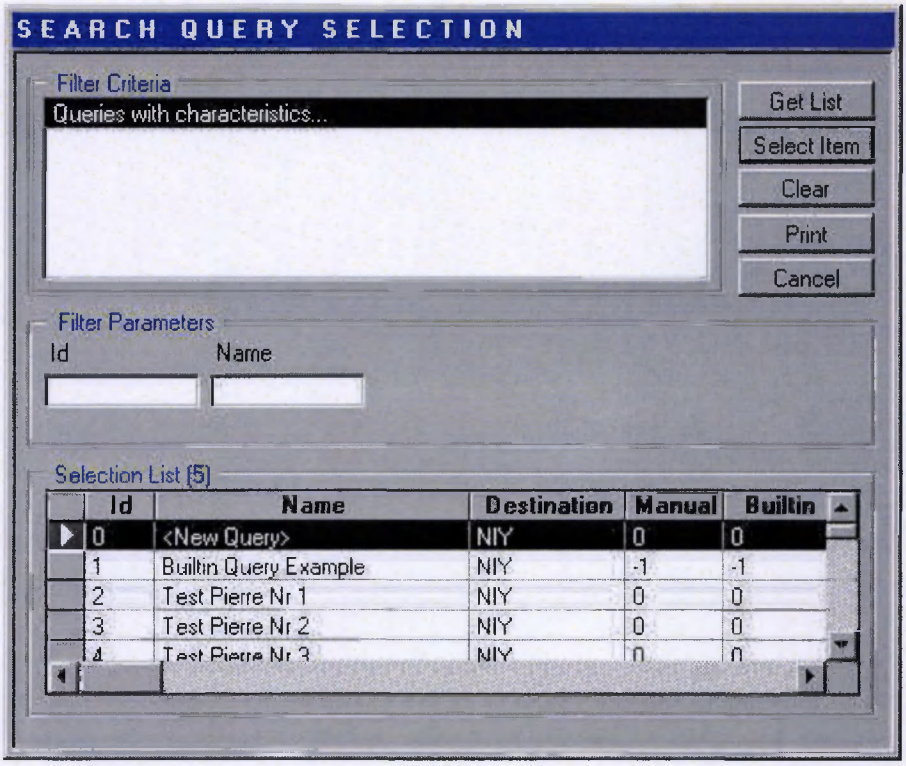


Figure 11. General selection form

- Filter Parameters: ID and Name of the query searched for
- Get List: Generates the requested list.
- Select Item: Selects the current item in the list and opens that particular query in the Query form.
- Clear: Clears the current selection.
- Print: Generates the 'Generic Reporting' menu:

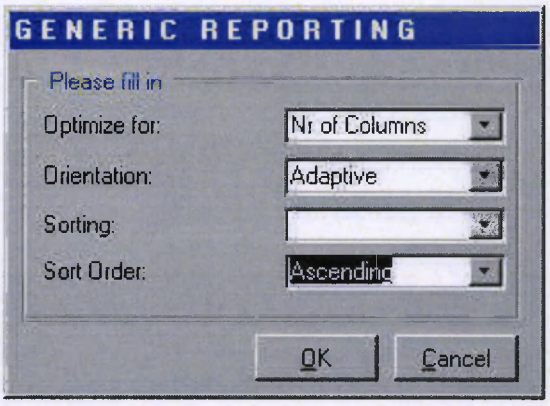


Figure 12. Generic reporting menu

Select one of the printing parameters:

Optimise for
Nr Of Columns
Column Widths
Orientation
Adaptive
Portrait
Landscape
Sorting
Built-in
Destination
Id
Manual
Name
Sort Order
Ascending
Descending

Table 8. Print specifications for a print of a 'Generic Report'

The 'Generic Report' is shown on the screen before being printed. An example of a 'Generic report is given below in Figure 13.

Search Query Selection R.U.G. Labo Marlene Biologie

Criterion:
Queries with characteristics...

Id	Name	Destination	Manual	Builtin
0	<New Query>	NIY	0	0
1	Builtin Query Example	NIY	-1	-1
2	Test Pierre Nr 1	NIY	0	0
3	Test Pierre Nr 2	NIY	0	0
4	Test Pierre Nr 3	NIY	0	0
5	Test Pierre Nr 4	NIY	0	0
6	Test Pierre Nr 5	NIY	0	0
10	CartesianProductQuery01	NIY	0	0
1000	Species for certain locations (Detailed)	NIY	-1	-1
1001	Species for certain locations (Grouped)	NIY	-1	-1
2007	Test Pierre Nr 6	NIY	0	0
2008	gds1	NIY	0	0
2009	gds2	NIY	0	0
2011	gds3	NIY	0	0
2012	gds4	NIY	0	0
2013	nooutput	NIY	0	0
2014	gds5	NIY	0	0
2015	z_Testing_B	NIY	0	0
2016	z_Testing_A	NIY	0	0
2017	a2x	NIY	0	0
2018	a1x	NIY	0	0

Figure 13. Print preview of Report

3.4.3.1.2 Destination

In this field, the output of the executed query has to be chosen. The different possibilities on output are listed in Table 9.

Destination
Datasheet (screen)
Text File (no layout)
Text File (grid-like)
MS Excel
Access Report
HTML (web format)
Rich Text Format

Table 9. Query output possibilities

3.4.3.1.3 Buttons

- ***New***: Clicking this button clears all the current fields and starts the building of a new query.
- ***Build***: Click this button to generate SQL from the query definition.
- ***Execute***: Click this button to generate SQL from the query definition and execute it. The result of the query will be send to the selected 'Destination'.

3.4.3.2 Manual SQL input

By means of the 'Search form', the user can build queries in **SQL** (**S**tructured **Q**uery **L**anguage). For users who are fully acquainted with the **SQL** syntax, the queries can be build manually. Click the 'Manual' check-box and enter the required **SQL** statements in a new query or edit the **SQL** statements in an existing query.

Figure 14. Search form for manually built queries

Most users however will build queries using the 'Search form menu'. This menu consists of four tabs (**Output**/**Criteria**/**Ordering**/**Statement**) that control the construction of a valid query and the output of it to a user-defined destination. The query module generates SQL on the basis of the choices the user has made and executes the statement, ONLY if this is a valid **SQL** statement. If it is not, the message 'Not a valid SQL statement' is shown!

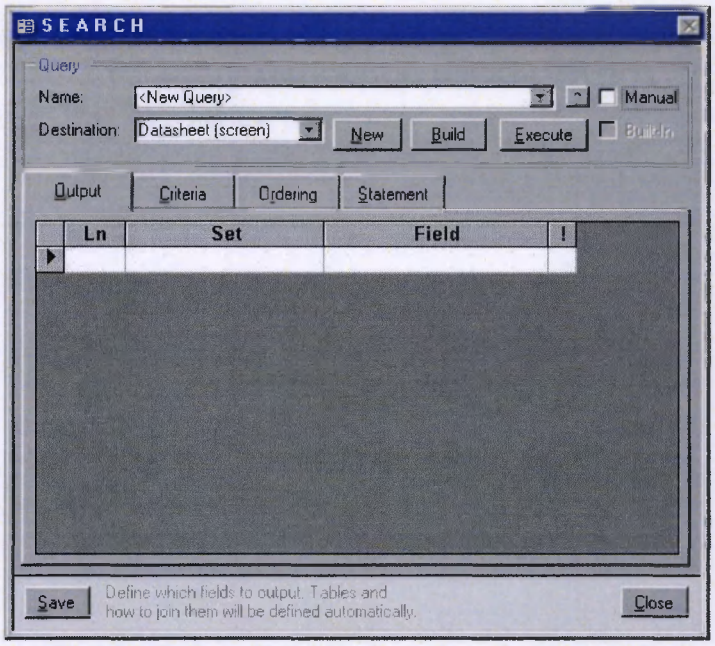


Figure 15. Search form for menu-built queries

The next part will explain the use of the Search form.

3.4.3.3 Output

By clicking the tab 'Output' it is made current; three columns appear: 'Ln', 'Set' and 'Field'.

3.4.3.3.1 Ln

This column shows the line number of the criterion. This number is generated automatically.

3.4.3.3.2 Set

The different fields that can be selected are grouped into 'Sets of fields'; click the ▼ button on the right of the current line to open a drop-down list with the 'Set' choices. Click a set to select it. A list of the different sets for Mysidlan is given in Table 10.

Set of Fields
Classification
Documents
Head
Thorax
Abdomen1
Abdomen2
Occurrence
Others

Table 10. Sets of fields

3.4.3.3.3 Field

After a 'Set' has been chosen, click the button on the right of the current line to open a drop-down list with the possible choices for the type of field. This is shown in Figure 16. The different field types are: Long (numeric), Integer (numeric), Single (numeric), Text (Text), Memo (Text).

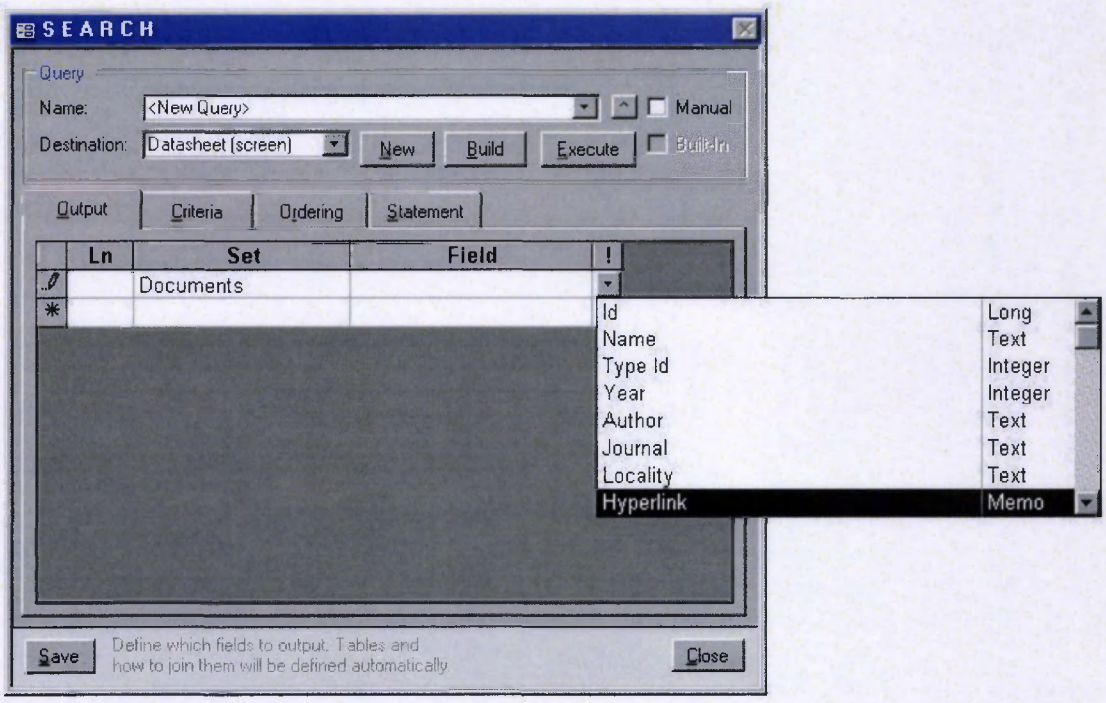


Figure 16. Example of field selection

A list of the different fields ordered by the 'set of fields' is given below.

Classification	Documents	Others
Classification Level Id.	Id.	Record Id.
Classification Item Id.	Name	Publish Y/N
Classification Description	Type Id.	Remarks
Classification Parent Level Id.	Year	Change Stamp
Classification Parent Item Id.	Author	Linked Documents
Species Name	Journal	Linked Documents Use Id.
Node Text	Locality	
Linked Document Id.	Hyperlink	
Linked Document Use Id.	Call Nr.	
	Hyperlink Address	

Table 11. List of output possibilities in the sets 'Classification', 'Documents' and 'Others'

Occurrence	Head	Thorax
Biotope Descr.	Min Length male	Min Carapace Length
Geographic Descr.	Max Length male	Max Carapace Length
Min Depth (m)	Min Length female	Pairs marsupial lamellae
Max depth (m)	Max Length female	Carapace Descr.
Min Longitude	Standard length male	Thoracopod Descr.
Max Longitude	Standard length female	
Min Latitude	Eyes Descr.	
Max Latitude	Antennal Scale Descr.	
	Mouth Descr.	

Table 12. List of output possibilities in the sets 'Occurrence', 'Head' and 'Thorax'.

Abdomen1 (*)	Abdomen2
Female pleopod rami	Statocyst
Male pleopod rami	Min Nr. Spines exopod
Female segments endopod	Max Nr Spines exopod
Female segments exopod	Min Nr. Spines endopod
Male segments endopod	Max Nr Spines endopod
Male segments exopod	Uropod Descr.
Female pleopod features	Telson Descr.
Male pleopod features	Min Nr. Spines Telson
	Max Nr. Spines Telson
	Min Nr. Spinules Telson
	Max Nr. Spinules Telson
	Length ratio telson

Table 13. List of output possibilities in the sets 'Abdomen1' and 'Abdomen2'

(*): Each of the items shown for 'Abdomen1' is given for each of the five pleopods.

3.4.3.4 Criteria

To make this tab current, click on the tab label 'Criteria'. In this tab, the search-criteria are defined. The real definition of the query is given by defining the different search criteria. How this must be done, will be explained in detail below. An example of the tab 'Criteria' is given in Figure 17.

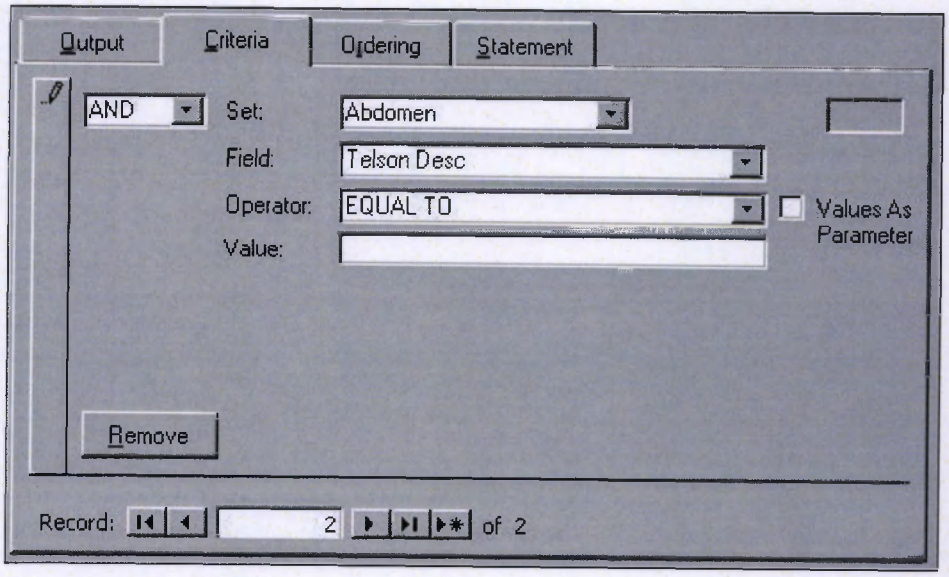


Figure 17. Example of the tab 'Criteria'

3.4.3.4.1 Boolean Operator

If only one criterion is defined, the Boolean Operator field is not active. From the moment that two or more criteria are defined, a 'Boolean operator' can be selected to combine the criteria. The default operator is always **AND,** and it is automatically generated by the system. It can be changed at any time.
The different values for a Boolean Operator are:

- ***And***: The linked criteria must both be present.
- ***Or***: At least one of the linked criteria must be present.
- ***And Not***: One criterion must be present while the linked criteria must be absent.
- ***XOR***: Only one of the criteria is present.

3.4.3.4.2 Set

The different fields that can be selected are grouped into 'Sets of fields'; click the ▼ button on the right of the field to open a drop-down list with the 'Set' choices. Click a set to select it. A list of the different sets for Mysidlan is given in Table 10.

3.4.3.4.3 Field

After a 'Set' has been chosen, click the ▼ button on the right of the field to open a drop-down list with the different choices. Click a field to select it. In the list, the type of the different fields is stated by a 'field-type' indicator. The different field types are: Long (numeric), Integer (numeric), Single (numeric), Text (Text), Memo (Text).

A list of the different fields is given in the tables below.

Classification	Documents	Others
Classification Level Id.	Id.	Record Id.
Classification Item Id.	Name	Publish Y/N
Classification Description	Type Id.	Remarks
Classification Parent Level Id.	Year	Change Stamp
Classification Parent Item Id.	Author	Linked Documents
Species Name	Journal	Linked Documents Use Id.
Node Text	Locality	
Linked Document Id.	Hyperlink	
Linked Document Use Id.	Call Nr.	
Kingdom	Hyperlink Address	
Phylum		
Class		
Subclass		
Order		
Suborder		
Superfamily		
Family		
Subfamily		
Genus		
Species		
Record		

Table 14. List of search possibilities in the sets 'Classification', 'Documents' and 'Others'

Occurence	Head	Thorax
Biotope Descr.	Min Length male	Min Carapace Length
Geographic Descr.	Max Length male	Max Carapace Length
Min Depth (m)	Min Length female	Pairs marsupial lamellae
Max depth (m)	Max Length female	Carapace Descr.
Min Longitude	Standard length male	Thoracopod Descr.
Max Longitude	Standard length female	
Min Latitude	Eyes Descr.	
Max Latitude	Antennal Scale Descr.	
	Mouth Descr.	

Table 15. List of search possibilities in the sets 'Occurrence', 'Head' and 'Thorax'

Abdomen1	Abdomen2
Female pleopod rami	Statocyst
Male pleopod rami	Min Nr. Spines exopod
Female segments endopod	Max Nr Spines exopod
Female segments exopod	Min Nr. Spines endopod
Male segments endopod	Max Nr Spines endopod
Male segments exopod	Uropod Descr.
Female pleopod features	Telson Descr.
Male pleopod features	Min Nr. Spines Telson
	Max Nr. Spines Telson
	Min Nr. Spinules Telson
	Max Nr. Spinules Telson
	Length ratio telson

Table 16. List of search possibilities in the sets 'Abdomen1' and 'Abdomen2'

(*): Each of the items shown for 'Abdomen1' is given for each of the five pleopods.

3.4.3.4.4 Operator

An operator must be selected to act on the selected field. The different possible operators are given in Table 17.

Operator
EQUAL TO
NOT EQUAL TO
GREATER THAN
SMALLER THAN
GREATER THAN OR EQUAL TO
SMALLER THAN OR EQUAL TO
IS NULL
NOT IS NULL
IN (List of choices)
BETWEEN

Table 17. List of possible operators in the Criteria-tab

3.4.3.4.5 Value

When certain operators are selected the 'Value' field appears. With certain 'Value' fields, a drop-down list is associated. Click the button to open the list. Refer to the Table 18 for details.

Operator	Value Field	+ drop-down List
EQUAL TO	Y	Y
NOT EQUAL TO	Y	Y
GREATER THAN	Y	N
SMALLER THAN	Y	N
GREATER THAN OR EQUAL TO	Y	N
SMALLER THAN OR EQUAL TO	Y	N
IS NULL	N	-
NOT IS NULL	N	-
IN (List of choices)	Y	Y
BETWEEN	Y (Value 1&2)	N

Table 18. Details on the different operator properties

3.4.3.4.6 Values as Parameter

Click the 'Values as Parameter' check-box to set the selected value as parameter. This option is not available for the 'IN' (List of choices) operator.

3.4.3.4.7 Remove

Click the 'remove' button to permanently remove the current criterion.

3.4.3.4.8 Navigation Statusbar

The arrows in the statusbar can be used to navigate through the different criteria. The navigation buttons are explained in Table 19.

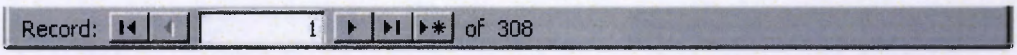


Figure 18. Navigation bar

Buttons	Function
	Go to first query
	Go to previous query
1	N° of current query
	Go to next query
	Go to last query
	New query
of 308	Total number of queries

Table 19. Elements of navigation bar

3.4.3.5 Ordering

By clicking on the Tab-label 'ordering', the tab is made current. Four columns appear: 'Ln', 'Set', 'Field' and 'Sorting'.
In this tab, the way in which the searched items must be ordered in the output is defined.

3.4.3.5.1 Ln

This column shows the line number of the ordering command. It is generated automatically.

3.4.3.5.2 Set

The different fields that can be selected, are grouped into 'sets of fields'; click the button on the right of the current line to open a drop-down list with the 'set' choices. Click a set to select it.

Set of Fields
Classification
Documents
Head
Thorax
Abdomen 1
Abdomen 2
Occurrence
Others

Table 20. Sets of Fields

3.4.3.5.3 Field

After a 'set' has been selected; click the button on the right of the current 'field' line to open a drop-down list with the different choices. On the right side of the list the 'field type' (Integer/Text/Memo/Long/Single) is indicated. Click a field to select it. Refer to the **Output/Field** section of this chapter for an overview of the fields that can be selected for ordering.

3.4.3.5.4 Sorting

Click the button on the right of the current line to open a drop-down list with the 'sorting' choices. Choose an option from the list:

Sorting
(None)
Ascending
Descending

Table 21. Sorting options

3.4.3.6 Statement

Click the tab 'statement' to make it current; the SQL statement for the current query is shown. Before using this option, the SQL has to be generated by clicking the 'build' button.

3.4.3.7 Extra

Below the different tabs, there is an extra space with two buttons and a message that gives a brief description of each of the tabs. An example is shown in Figure 19.

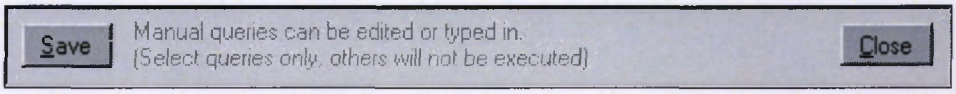


Figure 19. Example of the space below the tabs

There are two buttons on the tab: 'Save' and 'Close'

3.4.3.7.1 Save

Click this button to save the current query. When the 'Save Query' dialog-box appears, enter a name and click OK.
Query definitions are saved in the backend database (the data). In a multi-user environment, the queries produced by one user will also be available to other users. Additionally, it will be possible to start from a query from another user and adapt it to one's own needs or preferences.
While making changes, a full copy of the query definition is maintained on the local computer.

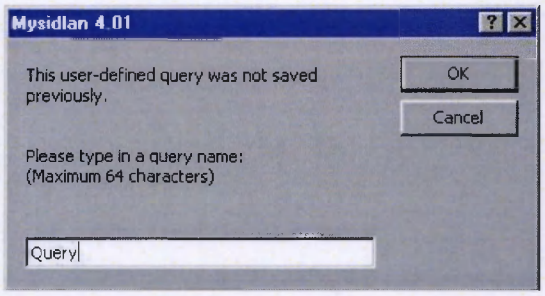


Figure 20. Save Query

If the name already exists, a warning message appears! Click Ok to close the message.

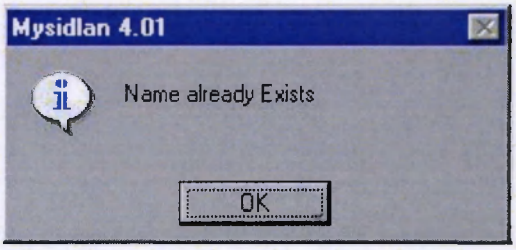


Figure 21. Save Query

If an existing query is saved after editing, confirmation is asked before saving.

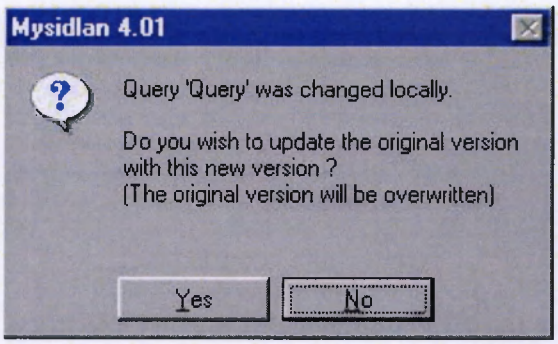


Figure 22. Update Query

3.4.3.7.2 Close

Click this button to close the Search form.

3.5 Quick – Search

3.5.1 Introduction

An alternative way of searching the data is to use the 'Quick-Search' tool. This tool allows a quick Search on the data, on a limited amount of items. The tool was created mainly as an aid in identification, but has also other possible uses.
Extra advantages in terms of data analysis are the output possibilities. The use of cross-tabels makes the data available for ecological interpretation.

3.5.2 Global overview

Globally, the quick-search works very easy. Search criteria can be entered in the list of 'Find Criteria', on the left hand side of the form. After clicking the 'Find' button, a list of corresponding records is given in the listbox on the right side. Each item in this list is clickable and by clicking on it, the tool automatically jumps to the corresponding record in the tree in the form 'Mysidacea' (Main menu: Data\Mysidacea). In this way, the chosen record can be seen completely.
Apart from to the 'Find'-option, there is also a wide variety of export-options to an Excel-file. The list of species resulting from a search can be exported to Excel (in taxonomic order if desired) and different data can be added to this sheet, so data-analysis can be done on it.
This whole idea is shown in Figure 23.

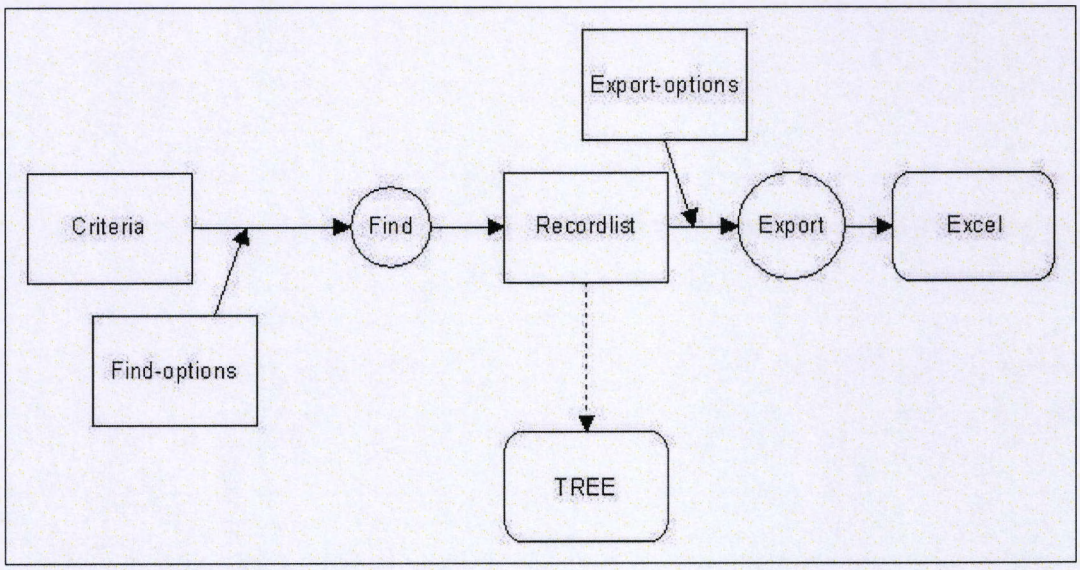


Figure 23. Overview of the working of the QuickSearch

3.5.3 Detailed explanation

3.5.3.1 Form overview

The form consists of three different parts: A left part with three tabs ('Find Criteria', 'Find Options', 'Export Options'), a right part with a species list and a lower part with some action-buttons. A shot of the screen is shown in Figure 24.

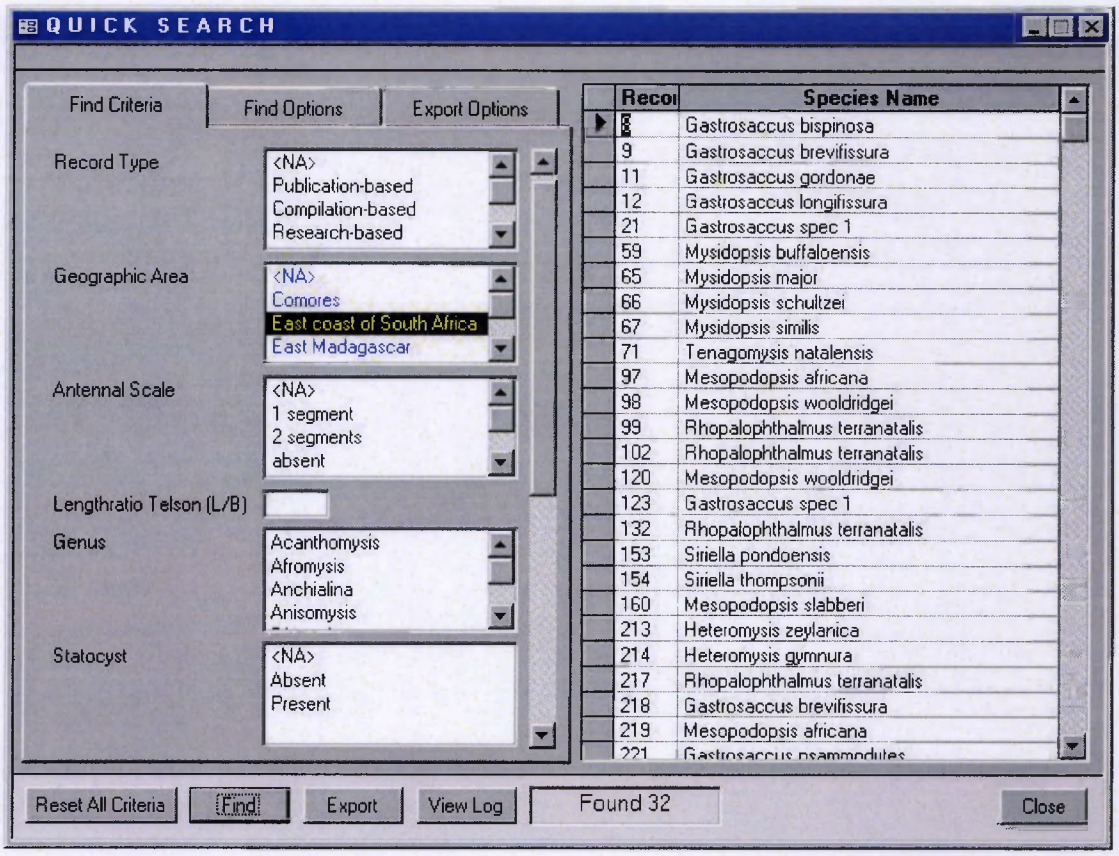


Figure 24. Example of the 'Quick-Search' form with its three different parts

3.5.3.2 Tabs

On the left side of the Quick Search form, there are three tabs: 'Find Criteria', 'Find Options' and 'Export Options'.

3.5.3.2.1 Find Criteria

The tab 'Find Criteria' makes it possible for the user to choose the characteristics on which search has to be done. The items available on the list were chosen by the author of the application. It were these items which contain data for the majority of the species.

In Table 22 the list of available criteria is shown. Next to the items in the list, a specification is added which concentrates on the use of the item.

☞ ***MC*** = Multiple Choice Box; different items in the multiple-choice list can be chosen at once to search on.

- ***SV*** = Single Value; the value typed in the field will be used to search in the records. For the items with this specification, there is a minimum and a maximum value available in the records. When searching on the item, the records will be shown in which the value is equal or in between the minimum and the maximum value.

- ***AV*** = Adaptable value; in those cases where there isn't a minimum and a maximum value available in the records, QuickSearch will accept specifying operators before the value (x), the default will be equal (=):
    - = x : Only the records with a value equal to asked value will be shown.
    - > x : Only the records with a value bigger than the asked value will be shown.
    - < x : Only the records with a value smaller than the asked value will be shown.
    - >= x : Only the records with a value bigger than the asked value or equal to it will be shown.
    - <= x : Only the records with a value smaller than the asked value or equal to it will be shown.

Criterion	Spec.
Record type	MC
Geographic Area	MC
Genus	MC
Female total length	SV
Male total length	SV
Antennal Scale	MC
Statocyst	MC
Uropod	MC
Nr spines endopod	SV
Nr spines exopod	SV
Telson	MC
Nr spines Telson	SV
Lengthratio Telson (L/B)	AV

Table 22. List of criteria with specifications.

After choosing the criteria to search on, clicking the 'find'-button below the tabs makes an itemlist appearing on the right side of the form.

A right-click on the criteria multiple-choice box brings up a menu (see with two items: Reset and Help. Choosing reset, resets only the criterion on which the right-click was done. None of the options in the criteria multiple-choice list will be selected any more.

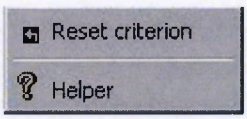


Figure 25. Illustration of the right click menu on the 'Criteria' tab

3.5.3.2.2 Find Options

The second tab 'Find Options' can be made current by clicking on it. This tab makes it possible to specify some properties of the find-action and some properties of how the itemlist must be shown. An illustration of the 'Find Options' tab is shown in Figure 26.

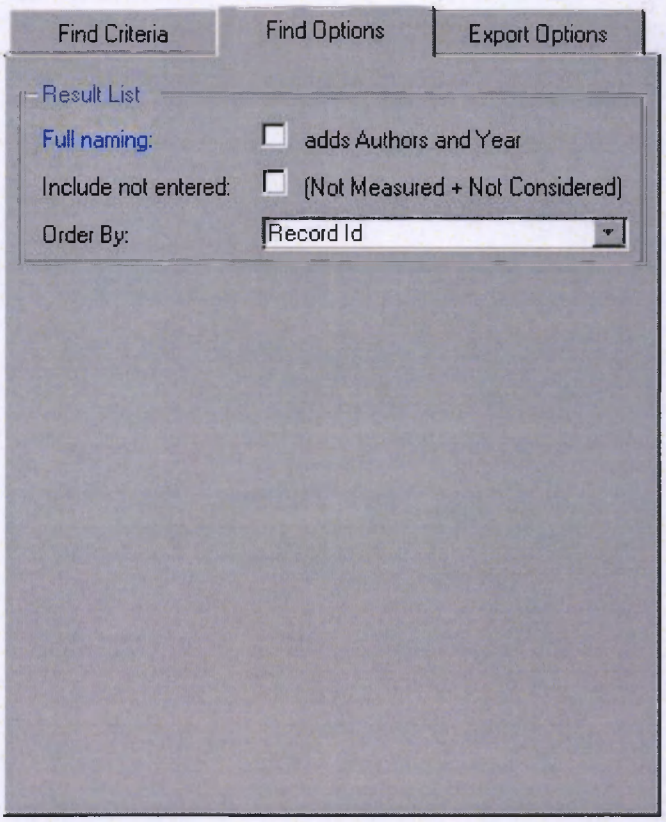


Figure 26. Illustration of the 'Find option' tab

The options for the resultlist are explained below.

- ***Full Naming***: When this possibility is flagged, the full naming of the species is shown.

Full Naming:		Genus species
	✓	Genus species author, year

Table 23. Illustration of full naming usage

- ***Include not entered***: When this option is switched on, the records where the chosen criteria are not entered will also be shown. In this way, exclusion of records with a lack of entered information is avoided.

- ***Order by***: The list of items found by the QuickSearch shown in the right area of the form, can be ordered on recordnr. or on Species Name.

3.5.3.2.3 Export Options

The third tab 'Export Options' can be made current by clicking on it. An example of this tab is given in Figure 27. A right click gives a menu with the option to reset the chosen specifications.

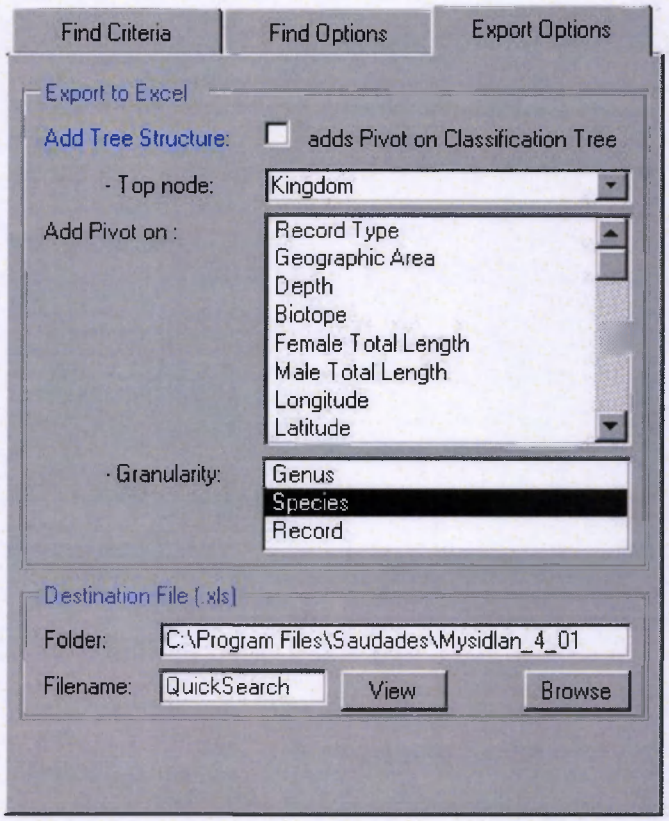


Figure 27. Illustration of the 'export' tab

Next to the search-capacity of the Quick Search, there is also a powerful way of exporting data to an excel sheet. In this way: data from the database can be exported into an interpretable format. On this Excel-sheet, data-analysis can be done.

The properties of the Excel sheet can be edited on this tab.
On the tab two areas are visible. The first area 'Export to Excel' defines the content of the Excel sheet, while the second area defines the destination of the Excel sheet.

A. Export to Excel

This area contains 4 items, which can be defined by the user.

- ***Add Tree Structure***: When this option is flagged, the list of items found by 'Quick Search' will be exported to the Excel sheet in taxonomic order. This means that the tree structure will be added to the Excel file, in which the records of the resultlist will be fitted. An example of the tree structure is given in Table 24. When this option is unflagged, the list of items will be exported to an Excel sheet without adding the tree structure.
  - ***Top Node***: In this list, the highest level of the tree structure can be defined. When, for instance, Class is chosen, all the taxonomic levels above Class won't be shown (e.g. Phylum, Subphylum).

Classification										
Kingdom	**Phylum**	**Class**	**Subclass**	**Order**	**Suborder**	**Family**	**Subfamily**	**Tribe**	**Genus**	**SpeciesName**
Animalia										
	Arthropoda									
		Crustacea								
			T_Subclass							
				Mysidacea						
					Mysida					
						Mysidae				
							Gastrosaccinae			
									Bispinosa	
										Gastrosaccus bispinosa
									Brevifissura	
										Gastrosaccus brevifissura
									Gordonae	
										Gastrosaccus gordonae
									Longifissura	
										Gastrosaccus longifissura

Table 24. Example of export to an Excel sheet with tree structure

RecordId	**SpeciesName**
8	Gastrosaccus bispinosa
9	Gastrosaccus brevifissura
11	Gastrosaccus gordonae
12	Gastrosaccus longifissura

Table 25. Example of export to an Excel sheet without tree structure

- ***Add Pivot on***: The list resulting from QuickSearch can be expanded with other data from the database. These expansions, the so-called 'Pivots' can be chosen from the list, and will assist in ecological interpretation.

  - ***Record type***: When this pivot is chosen, 5 columns are added to the basic Excel-file (with or without tree structure, see above). These columns have the labels corresponding with the different types of records. In the column corresponding with the record, an indicator is shown.

  - ***Geographic Area***: When this pivot is chosen, a number of columns corresponding with the number of items in the list of Geographic Areas, are added to the basic Excel-file (with or without tree structure, see above). These columns have labels corresponding with the different areas described in the part 'Geography' of this manual. The values present in the records from the itemlist are shown in the corresponding column by an indicator.

  - ***Depth***: When this pivot is chosen, 10 columns are added to the basic Excel-file (with or without tree structure, see above). The labels give a certain range. These ranges are: 0-2m, 2-10m, 10-50m, 50-100m, 100-200m, 200-500m, 500-1000m, 1000-3000m, 3000-6000m, 6000-m. The minimum and maximum depth in the record are displayed in the columns with the corresponding ranges. The depths in between the column with the maximum value and the column with the minimum value are also shown by an indicator.

  - ***Biotope***: When this pivot is chosen, a number of columns corresponding with the number of items in the list of biotopes are added to the basic Excel-file (with or without tree structure, see above). These columns have labels corresponding with the different areas described in the part 'Habitat' of this manual. The values present in the records from the itemlist are shown in the corresponding column by an indicator.

  - ***Female Total length***: When this pivot is chosen, 25 columns are added to the basic Excel-file (with or without tree structure, see above). The labels give a certain range. These ranges are: 1-2mm, 2-3mm, 3-4mm, 4-5mm, 5-6mm, 6-7mm, 7-8mm, 8-9mm, 9-10mm, 10-11mm, 11-12mm, 12-13mm, 13-14mm, 14-15mm, 15-16mm, 16-17mm, 17-18mm, 18-19mm, 19-20mm, 20-21mm, 21-22mm, 22-23mm, 23-24mm, 24-25mm, 25- mm. The minimum and maximum length values in the record are displayed in the columns with the corresponding ranges. The lengths in between the column with the maximum value and the column with the minimum value are also shown by an indicator.

  - ***Male total length***: When this pivot is chosen, 25 columns are added to the basic Excel-file (with or without tree structure, see above). The labels give a certain range. These ranges are: 1-2mm, 2-3mm, 3-4mm, 4-5mm, 5-6mm, 6-7mm, 7-8mm, 8-9mm, 9-10mm, 10-11mm, 11-12mm, 12-13mm, 13-14mm, 14-15mm, 15-16mm, 16-17mm, 17-18mm, 18-19mm, 19-20mm, 20-21mm, 21-22mm, 22-23mm, 23-24mm, 24-25mm, 25- mm. The minimum and maximum length values in the record are displayed in the columns with the corresponding ranges. The lengths in between the

column with the maximum value and the column with the minimum value are also shown by an indicator.

- ***Longitude***: When this pivot is chosen, **72** columns are added to the basic Excel-file (with or without tree structure, see above). The labels give a certain range. These ranges are intervals of 5 degrees, going from –180° (WL) up to 180° (EL). The minimum and maximum longitudes in the record are displayed in the columns with the corresponding ranges. The longitudes in between the column with the maximum value and the column with the minimum value are shown also by an indicator.

- ***Latitude***: When this pivot is chosen, **31** columns are added to the basic Excel-file (with or without tree structure, see above). The labels give a certain range. These ranges are intervals of 5 degrees, going from –80° (SB) up to 75° (NB). The minimum and maximum latitudes in the record are displayed in the columns with the corresponding ranges. The latitudes in between the column with the maximum value and the column with the minimum value are shown also by an indicator.

- ***Eye***: When this pivot is chosen, a number of columns corresponding with the number of items in the list of eye shapes is added to the basic Excel-file (with or without tree structure, see above). These columns have labels corresponding with the different areas described in the part 'Eyes' of this manual. The values present in the records from the itemlist are shown in the corresponding column by an indicator.

- ***Antennal scale***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Antennal scale' from the manual.

- ***Mouth part***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Mouth Part' from the manual.

- ***Marsupial lamellae***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Marsupial lamellae' from the manual.

- ***Carapace***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Carapace' from the manual.

- ***Thoracopod***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Thoracopod' from the manual.

- ***Uropod***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Uropod' from the manual.

- ***Telson***: Same as the topic 'Pivot on eyes'. The items in the column headings correspond with the list of shapes described in the part 'Telson' from the manual.

Some examples of pivots are given in the tables below:

		Record Type				
RecordId	**SpeciesName**	**<NA>**	**Publication-based**	**Compilation-based**	**Research-based**	**Genome-based**
8	Gastrosaccus bispinosa		1			
9	Gastrosaccus brevifissura		1			
11	Gastrosaccus gordonae		1			
12	Gastrosaccus longifissura		1			

Table 26. Example of the pivot on recordtype.

		Eyes							
RecordId	**Species Name**	**<NA>**	**absent**	**accessory eye**	**extremely reduced**	**fused**	**globular**	**not stalked**	**plate-like**
4	Spelaeomysis cochinensis		1						
6	Spelaeomysis longipes								1
15	Spelaeomysis longipes				1	1			1
216	Spelaeomysis longipes		1						
18	Spelaeomysis servatus								1
187	Spelaeomysis servatus								1

Table 27. Example of the pivot on eyes.

		Geographic Area											
RecordId	Species Name	<NA>	Comores	East coast of South Africa	East Madagascar	Gulf of Aden	Gulf of Oman	Kenya	Laccadives	Maldives	Mauritius	Namibia	North India
8	Gastrosaccus bispinosa			1									
9	Gastrosaccus brevifissura		1	1									
11	Gastrosaccus gordonae			1									
12	Gastrosaccus longifissura			1									

Table 28. Example of the pivot on Geographic Area.

	Depth									
Species Name	0-2'	2-10'	10-50'	50-100'	100-200'	200-500'	500-1000'	1000-3000'	3000-6000'	6000-'
Gastrosaccus bispinosa	*	*								
Gastrosaccus brevifissura										
Gastrosaccus gordonae										
Gastrosaccus longifissura	*	*								

Table 29. Example of the pivot on depth.

	Biotope									
Species Name	<NA>	bathypelagic	brackish	clay	coastal	commensal	crab-holes	epipelagic	estuarine	fresh water
Gastrosaccus bispinosa					1					
Gastrosaccus brevifissura										
Gastrosaccus gordonae										
Gastrosaccus longifissura					1					

Table 30. Example of the pivot on Biotope.

- ***Granularity***: This option makes it possible to choose the lowest level of output in the Excel-sheet. The choices made in this list influence the way of generating the pivots. A summary of the possibilities is given below:

1. | Genus |
| --- |
| Species |
| Record |

This first possibility will not be allowed to export to the excel-sheet because no lowest level of export has been chosen. An error message will appear.

2. | Genus |
| --- |
| Species |
| Record |

When only the record level is chosen, the export to the Excel sheet will be done without showing the genus names and without showing the species names. A list of records will be given. The records will be shown by the record number and the name of the species to which the record is attached (So-called full naming of the record)

Example:

Lepidomysidae
Nr 29: **Spelaeomysis cochinensis** Panampunnayil, S.U. 1991 [SCAN]
Nr 176: **Spelaeomysis longipes** Pillai, N.K. 1955 [SCAN]
Nr 230: **Spelaeomysis longipes** Nath, C. N.; Pillai, N. K. 1971 [SCAN]
Nr 30: **Spelaeomysis longipes** Pillai, N.K. 1964 [SCAN]

3. | Genus |
| --- |
| Species |
| Record |

Only the species level will be shown. The genus level will be missing. The indicators in the added pivots will be counts of a certain item, available in the records of the species.

Example:

Lepidomysidae
Spelaeomysis cochinensis Panampunnayil, 1991
Spelaeomysis longipes Pillai, 1964

4. | Genus |
| --- |
| Species |
| Record |

By selecting the 'Species' and the 'Record' level, the output will be given in an almost complete way: the species name will be shown (eventually with author and year = full naming) and the record information (=recordnr. & data source) will be available. The name of the genus is not available on the sheet.

Example:

Lepidomysidae
Spelaeomysis cochinensis Panampunnayil, 1991
Nr 29: Panampunnayil, S.U. 1991 [SCAN]
Spelaeomysis longipes Pillai, 1964
Nr 176: Pillai, N.K. 1955 [SCAN]
Nr 230: Nath, C. N.; Pillai, N. K. 1971 [SCAN]
Nr 30: Pillai, N.K. 1964 [SCAN]

5. Genus
Species
Record

Choosing only the genus in the granularity box will export the data to Excel, only showing the genus name without information on the species and records. The indicators in the added pivots will be counts of a certain item, available in the records of the species belonging to the genus.

Example:
Lepidomysidae
Spelaeomysis

6. Genus
Species
Record

This option shows the genus name and all the record information. The records are indicated by their number and the species name of the species to which they are connected.

Example:
Lepidomysidae
Spelaeomysis
Nr 29: **Spelaeomysis cochinensis** Panampunnayil, S.U. 1991 [SCAN]
Nr 176: **Spelaeomysis longipes** Pillai, N.K. 1955 [SCAN]
Nr 230: **Spelaeomysis longipes** Nath, C. N.; Pillai, N. K. 1971 [SCAN]
Nr 30: **Spelaeomysis longipes** Pillai, N.K. 1964 [SCAN]

7. Genus
Species
Record

Choosing 'genus' and 'Species' in the granularity box will export the data to a sheet with only the genus and the species level. No record data will be available. The indicators in the added pivots will be counts of a certain item, available in the records of the species.

Example:
Lepidomysidae
Spelaeomysis
Spelaeomysis cochinensis Panampunnayil, 1991
Spelaeomysis longipes Pillai, 1964

8. Genus
Species
Record

By selecting the three levels, the output will be given in the most complete way: The genus name will be shown, the species name will be shown (with author and year = full naming) and the record information (=recordnr. & data source) will be available.

Example:
Lepidomysidae
Spelaeomysis
Spelaeomysis cochinensis Panampunnayil, 1991
Nr 29: Panampunnayil, S.U. 1991 [SCAN]
Spelaeomysis longipes Pillai, 1964
Nr 176: Pillai, N.K. 1955 [SCAN]
Nr 230: Nath, C. N.; Pillai, N. K. 1971 [SCAN]
Nr 30: Pillai, N.K. 1964 [SCAN]

B. Destination File

This area of the tab 'Export Options' is used to define the destination and name of the new Excel file.

- ***Folder***: This field can be used to input the destination folder of the file. It can also be set by the browse-button, by navigating through the folders in the classic way (see Figure 28).

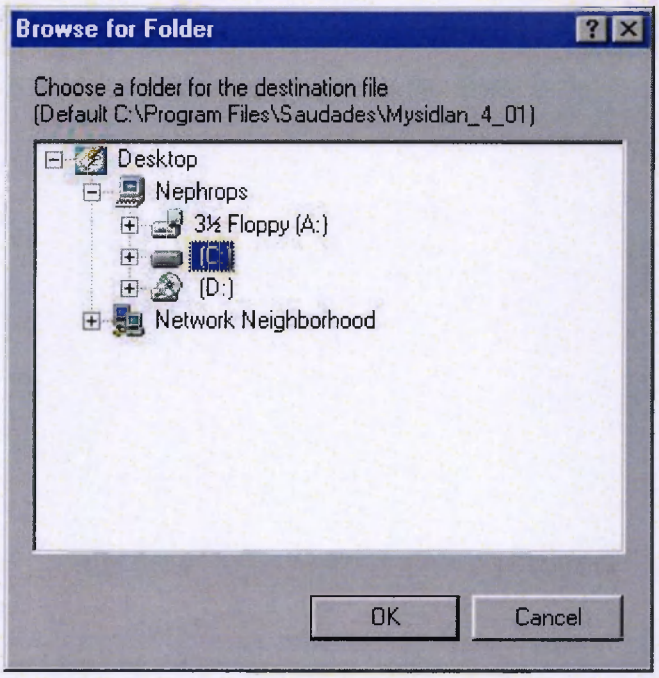


Figure 28. Illustration of the 'Browse' form

- ***Filename***: This field is the field in which the name of the new Excel file must be typed.

3.5.3.3 Itemlist

The left area of the QuickSearch form gives the list of items found by the search action, based on the criteria entered into the left area (see Figure 29).

Recor	Species Name
8	Gastrosaccus bispinosa
9	Gastrosaccus brevifissura
11	Gastrosaccus gordonae
12	Gastrosaccus longifissura
21	Gastrosaccus spec 1
59	Mysidopsis buffaloensis
65	Mysidopsis major
66	Mysidopsis schultzei
67	Mysidopsis similis
71	Tenagomysis natalensis
97	Mesopodopsis africana
98	Mesopodopsis wooldridgei
99	Rhopalophthalmus terranatalis
102	Rhopalophthalmus terranatalis
120	Mesopodopsis wooldridgei
123	Gastrosaccus spec 1
132	Rhopalophthalmus terranatalis
153	Siriella pondoensis
154	Siriella thompsonii
160	Mesopodopsis slabberi
213	Heteromysis zeylanica
214	Heteromysis gymnura
217	Rhopalophthalmus terranatalis
218	Gastrosaccus brevifissura
219	Mesopodopsis africana
221	Gastrosaccus psammodutes

Figure 29. Itemlist from the 'QuickSearch' form

The Itemlist contains two columns: a first one with the record number and a second one with the species name to which the record is connected. This species name can be completed with the authors name and year of description, by flagging the 'full naming' option in the tab 'Find Options'. The list will be updated to the new 'Find Criteria' each time the Find-button in the lower statusbar is clicked.

It is possible to go from a record in the Itemlist to the full record of the corresponding node. By double-clicking on a record from the list, the editing form is opened, and the relevant record highlighted. Right-clicking on any record in the result list opens a menu with the action 'Jump to record'. Choosing this action does the same as described above.

3.5.3.4 Lower statusbar

An illustration of this statusbar is given below in Figure 30.

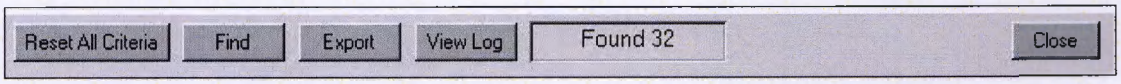


Figure 30. Illustration of the statusbar shown in the QuickSearch form

3.5.3.4.1 Reset all Criteria

Clicking this button resets all the criteria.

3.5.3.4.2 Find

Clicking this button lets the QuickSearch search on the highlighted 'Find Criteria'. When no criterion has been chosen, all records are listed.

3.5.3.4.3 Export

Clicking this button starts the export of the Find-results to an Excel file, according to the options chosen in the 'Export Options' tab. Excel will be opened automatically if the application wasn't running yet and the file will be shown.

3.5.3.4.4 View Log

Clicking this button makes a log in which an overview of all the chosen options at the time are given, appearing in a text window. This log can be useful to analyse the steps taken and compare it with former or future actions in the QuickSearch.

3.5.3.4.5 Count-field

This field shows the number of found items after a find action. This field is not editable or clickable by the user.

3.5.3.4.6 Close

This button closes the 'Quick Search' form.

4. REPORTING

4.1 Last Tree Print

When the user wants to see the last printout of the tree, this can be done by going to the item 'Last tree Print' on the subject 'Reporting' from the main menubar.
By choosing this action the Last printout from the tree is opened again. This last printout was created in the 'editing' form by a right click and the choice of the option 'Print tree' (Printtree).
When there is no tree print available an error-message will be given and first the 'Printtree' action must be done (as described above), before the tree can be opened from the main menu.

Navigation through the different pages of the 'treeprint' is possible in two ways:
1. Using 'Page-Up' and 'Page-Down' button.
2. Using the navigation statusbar (shown in Figure 31).

Figure 31. Illustration of the navigation statusbar in the Printtree window

Buttons	Function
	Go to first page
	Go to previous page
4	N° of current page
	Go to next page
	Go to last page

Table 31. Function of the buttons from the navigation statusbar

The treeprint can be watched more in detail by clicking on it. When moving the cursor into the window, it changes from an arrow into a magnifying glass ( ). When magnified it can only be restored to the original size.

When the last print of the tree is shown in a window, the menu bar changes automatically. Only two items are still available: 'Print' and 'View'.

4.2 Print

The viewed tree can be printed by choosing 'Print' from the menu (shown in Figure 32).
The settings of the printer can be edited in the option 'Printer Settings'.
The tree can be saved into a file by the 'Save' option. The form can be closed by the 'Close' option.

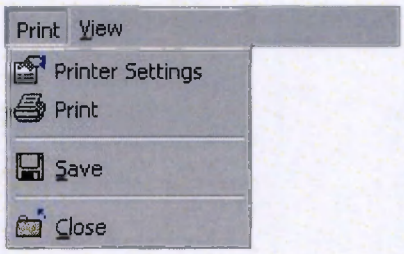


Figure 32. Illustration of the 'Print' submenu

4.3 View

The view item from the menu lets the user define the view properties for watching the tree.

- The magnification can be set with the item 'zoom' from the 'view' menu (see Figure 33). There it can be chosen whether the tree must be showed at 10%, whether at 200% or somewhere in between. The option 'In Window' lets the viewed page shrink in that way that its width fits in the window.

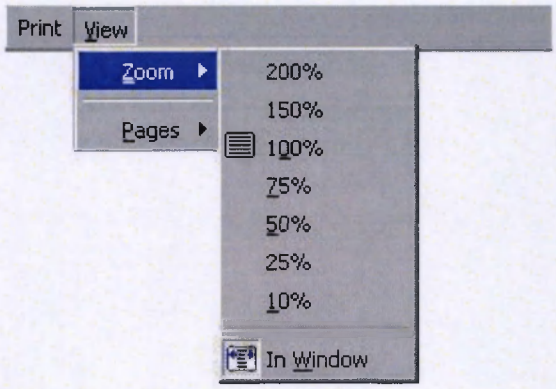


Figure 33. Zoom submenu from the main menu in the 'Print tree' form

- The number of pages that must be shown can be set with item 'Pages' from the 'view' menu (see Figure 34). At once 1, 2, 4, 8 or twelve pages can be seen.

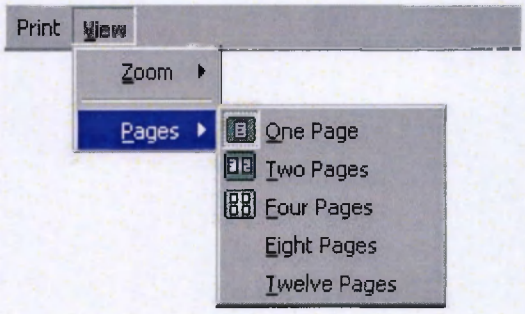


Figure 34. Pages-submenu from the main menu in the 'Print tree' form

5. SYSTEM

This part of the main menu is used to configure the system, and to enter data in some look-up tables. There are four options within the System menu, which will be discussed more in detail in the different parts:

- Maintenance
- Tables
- Security
- Logs

5.1 Maintenance

The maintenance item in the system menu contains three different items, which are shown in a separate submenu, illustrated in figure 1.

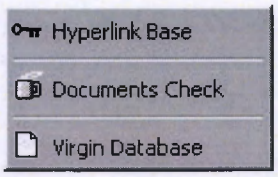


Figure 35. Illustration of the maintenance submenu

The three different items (Hyperlink Base, Documents Check and Virgin Database) will be discussed further on.

5.1.1 Hyperlink Base

This option is used to define the path where the electronic documents can be found. By choosing this item, a dialog box is shown as Figure 36.

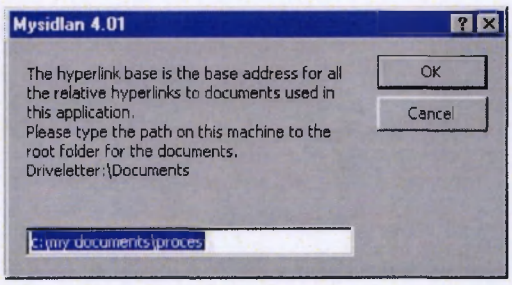


Figure 36. Illustration of the hyperlink dialog box.

In the field the path has to be filled in manually.

5.1.2 Documents check

This process compares the document links in the database with the electronic documents located under the path defined by hyperlink Base as set through the menu item 'Hyperlink base' (see page 63) . This verification will also automatically correct non-relative addresses, missing .pdf extensions, and missing # separators. It will further attempt to judiciously supply missing Display Text and correct usage of Classification Links whenever possible.

Going through this process can be done in different ways. Different dialog boxes ask in what way the update of the database has to be done or in how far naming has to be corrected. In the end, a log can be seen in .txt format. In this way, it is possible to see what the documents check corrected and which changes it has caused in the database.
See examples of the forms on page 84.

5.1.3 Virgin database

This tool can be used to generate a new database based on the current one. Depending on the choices in the dialog box, the new database will, more or less, contain data from the mother database. In Figure 37, the dialog box is shown. Below this box the different fields are briefly explained:

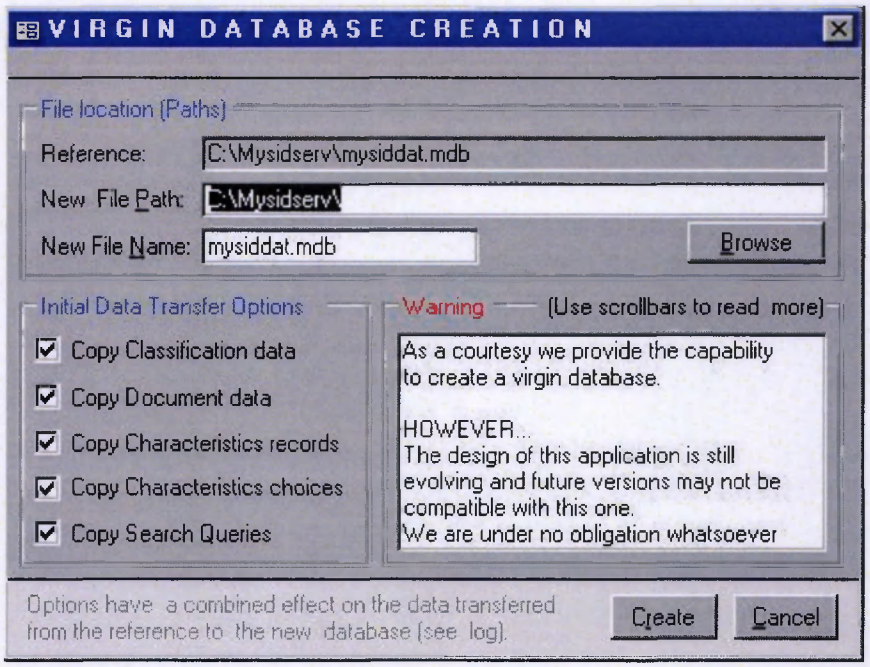


Figure 37. Illustration of the dialog box for creating a virgin database

5.1.3.1 File location

5.1.3.1.1 Reference

Indicates the path of the mother database that is used to create the new database.

5.1.3.1.2 New file path

Indicates the path where the new virgin database will be saved. This path can be changed manually or by the browse button.

5.1.3.1.3 New file name

Indicates the name of the new database, which will be stored on the new file path.

5.1.3.2 Initial data transfer Options

5.1.3.2.1 Copy classification data

When this option is flagged, the classification tree will automatically be added to the virgin database. When this option is not flagged, then the "copy characteristics records" is automatically unflagged, which is logical.

5.1.3.2.2 Copy document data

When this option is flagged then the document database will be added to the new database. This also means that the links in the tree stay available.

5.1.3.2.3 Copy characteristics records

When this option is flagged the records under species level are also copied. This also means that the complete database, except possibly the document information, is copied in the virgin database.

5.1.3.2.4 Copy characteristics choices

This option indicates that, if flagged, the choice tables for each multiple-choice box or listbox are saved in the new database. If not flagged, the former option is also automatically unflagged. These tables with choices can later be generated or edited through System - Tables (see page 68).

5.1.3.2.5 Copy search queries

This option indicates that the saved search queries in the mother database are copied to the new database.

5.1.3.3 Warning

This message indicates that the databases are still under progress and that this tool may not be compatible with newer versions.

5.2 Security

This item in the system menu manages the use of the database. Users can be defined, added, deleted; passwords can be changed, …

The different items in the security menu are: Password, Your Membership, Groups, Users, Membership and Permission.

5.2.1 Password

In this item, the password of the current user can be changed. The dialog box is shown in Figure 38.

Figure 38. Illustration of the dialog box for changing the password.

The name of the user is indicated in the square surrounding the three fields. In this case the user is Sysop. In the field "Old" the recent password must be added. In the field next to "new" the new password has to be filled in for the first time and after that a second time in the field next to "Repeat". When the information is filled in correctly, the change button can be chosen and the password will be changed. The next time the user logs in the new password has to be used.

In the future the possibilities of the application will be expanded. It will be possible to create different users with their own permissions. These functions will be included in the menu items 'Your membership', 'Groups', 'Users', 'Membership' and 'Permission'.

5.3 Tables

This item of the system menu is the one that is used to modify the look-up tables that provide the content for the different multiple-choice boxes and the listboxes. The application Mysidlan has a total of 14 different tables that define the different choices in the tabs.

Modification of these lists is possible by deleting or adding items to the list. Each item in one of these lists has an ID-number, which is not created automatically but must be entered manually. The changes in the table are reflected in the tabs after closing and opening the application.

In what follows an overview of all the tables is given with each time an indication in which tab and which field(s) the table is reflected. Each time there is also a link to the descriptions of the different items in the other parts of the manual.

Name of table
Antennal scales
Biotopes
Carapaces
Eyes
Features
Geographic areas
Marsupial lamellae
Mouth parts
Pleopod rami
Segments
Statocyst
Telsons
Thoracopods
Uropods

Table 32. List of different tables.

5.3.1 Antennal scales

Used in: Tab: Head Field(s): Antennal scale

Example of the look-up table on page 81
Detailed description of the items on page 136

5.3.2 Biotopes

Used in: Tab: Occurrence Field(s): Biotope

Example of the look-up table on page 82
Detailed description of the items on page 117

5.3.3 Carapaces

Used in: Tab: Thorax Field(s): Carapace

Example of the look-up table on page 82
Detailed description of the items on page 151

5.3.4 Eyes

Used in: Tab: Head Field(s): Eye

Example of the look-up table on page 83
Detailed description of the items on page 130

5.3.5 Features

Used in: Tab: Abdomen2 Field(s): Pleopod1 female
Pleopod2 female
Pleopod3 female
Pleopod4 female
Pleopod5 female
Pleopod1 male
Pleopod2 male
Pleopod3 male
Pleopod4 male
Pleopod5 male

Example of the look-up table on page 83
Detailed description of the items on page 166

5.3.6 Geographic areas

Used in: Tab: Occurrence Field(s): Geographic area

Example of the look-up table on page 84
Detailed description of the items on page 89

5.3.7 Marsupial lamellae

Used in: Tab: Thorax Field(s): Pairs marsupial lamellae

Detailed description of the items on page 163

5.3.8 Mouth parts

Used in: Tab: Head Field(s): Mouth part

Detailed description of the items on page 147

5.3.9 Pleopod rami

Used in: Tab: Abdomen2 Field(s): Pleopod1 female
Pleopod2 female
Pleopod3 female
Pleopod4 female
Pleopod5 female
Pleopod1 male
Pleopod2 male
Pleopod3 male
Pleopod4 male
Pleopod5 male

Detailed description of the items on page 164

5.3.10 Segments

Used in: Tab: Abdomen2 Field(s): Pleopod1 female
Pleopod2 female
Pleopod3 female
Pleopod4 female
Pleopod5 female
Pleopod1 male
Pleopod2 male
Pleopod3 male
Pleopod4 male
Pleopod5 male

Detailed description of the items on page 166

5.3.11 Statocyst

Used in: Tab: Abdomen2 Field(s): Statocyst

Detailed description of the items on page 170

5.3.12 Telsons

Used in: Tab: Abdomen2 Field(s): Telson

Detailed description of the items on page 176

5.3.13 Thoracopods

Used in: Tab: Thorax Field(s): Thoracopod

Detailed description of the items on page 158

5.3.14 Uropods

Used in: Tab: Abdomen2 Field(s): Uropod

Detailed description of the items on page 171

6. EXAMPLES OF SCREENGRABS

6.1 Genus-link tab

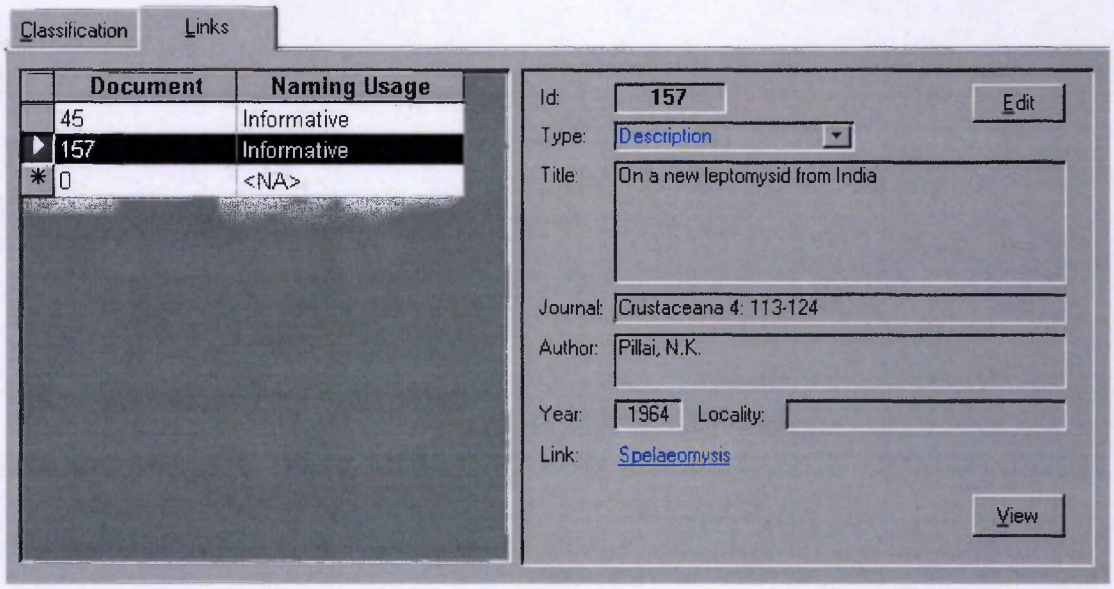


Figure 39. Illustration of the genus-link tab

6.2 Species-link tab

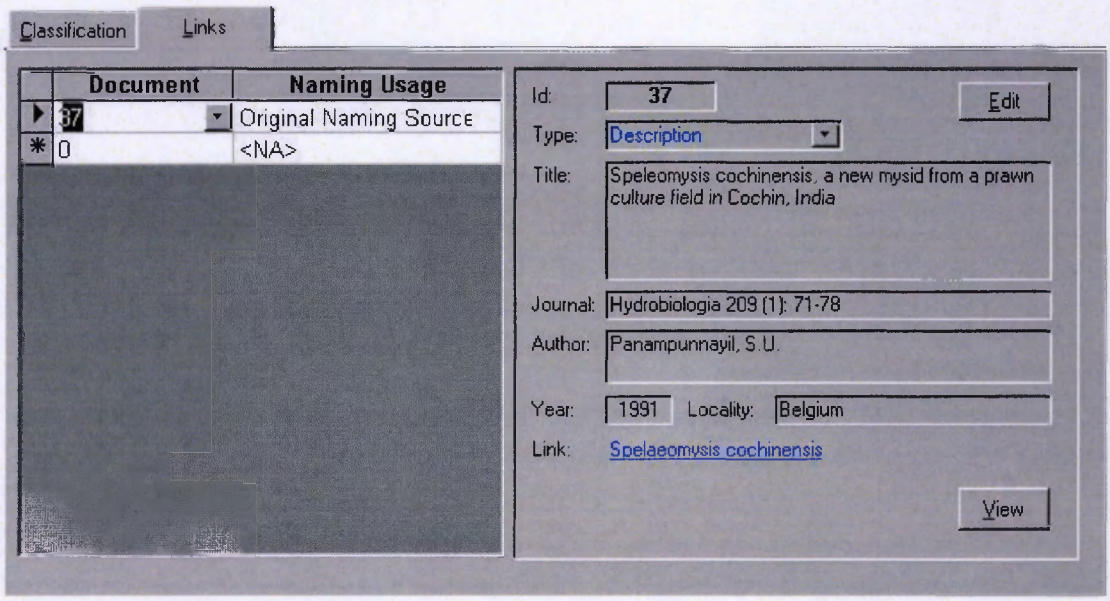


Figure 40. Illustration of the species-link tab

6.3 Record-link tab

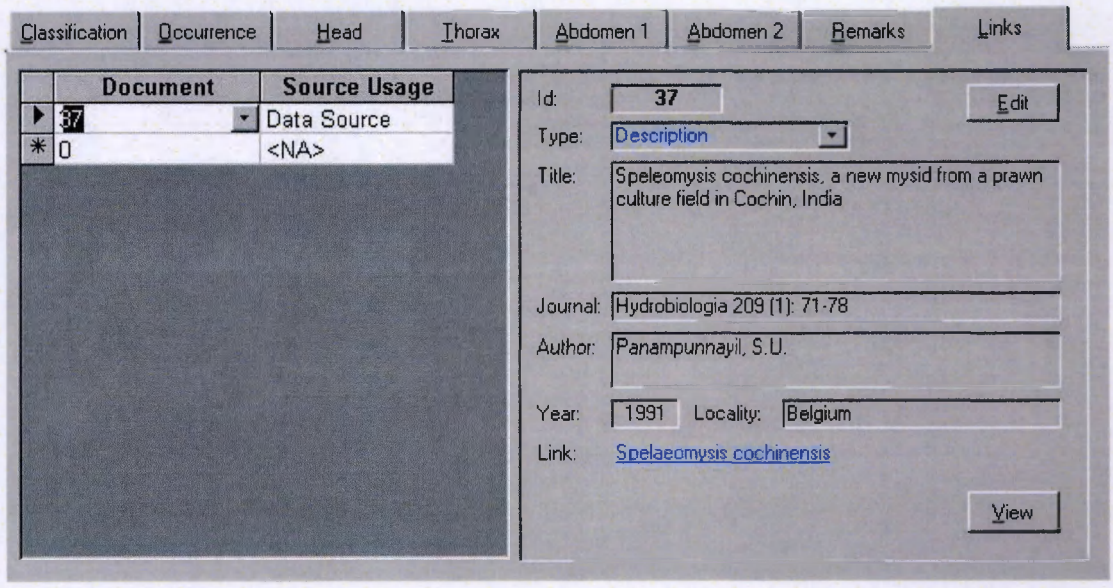


Figure 41. Example of the links tab on record level in the editing form

6.4 Example menu 1

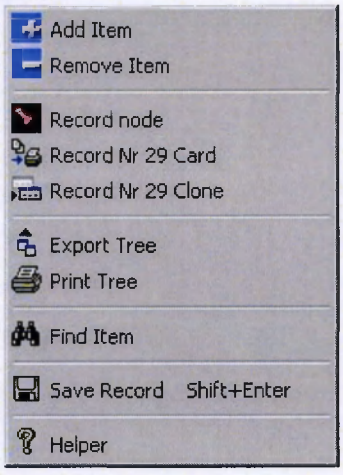


Figure 42. Example of right-click menu 1

6.5 Example menu 2

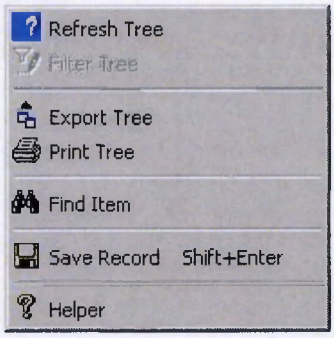


Figure 43. Example of right-click menu 2

6.6 Example of the remarks menu

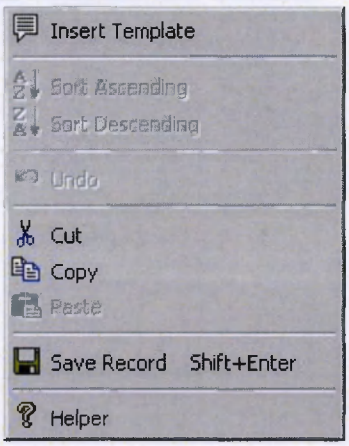


Figure 44. Example of the remarks menu in the editing form

6.7 Example of the statusbar

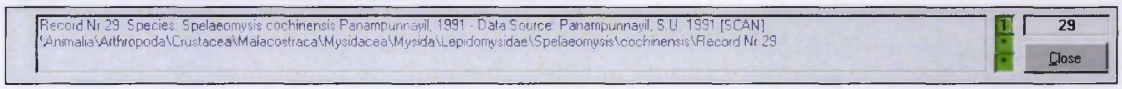


Figure 45. Example of the status bar in the editing form

6.8 Example of the scroll list in the genus-link tab

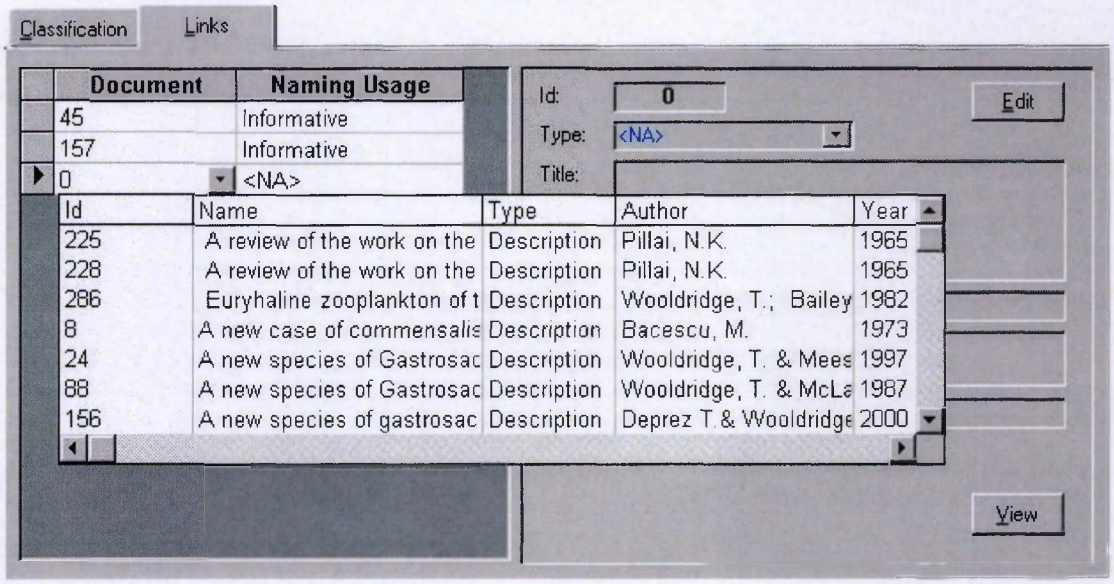


Figure 46. Example of the scroll list in the genus-link tab

6.9 Example of the scroll list in the species-link tab

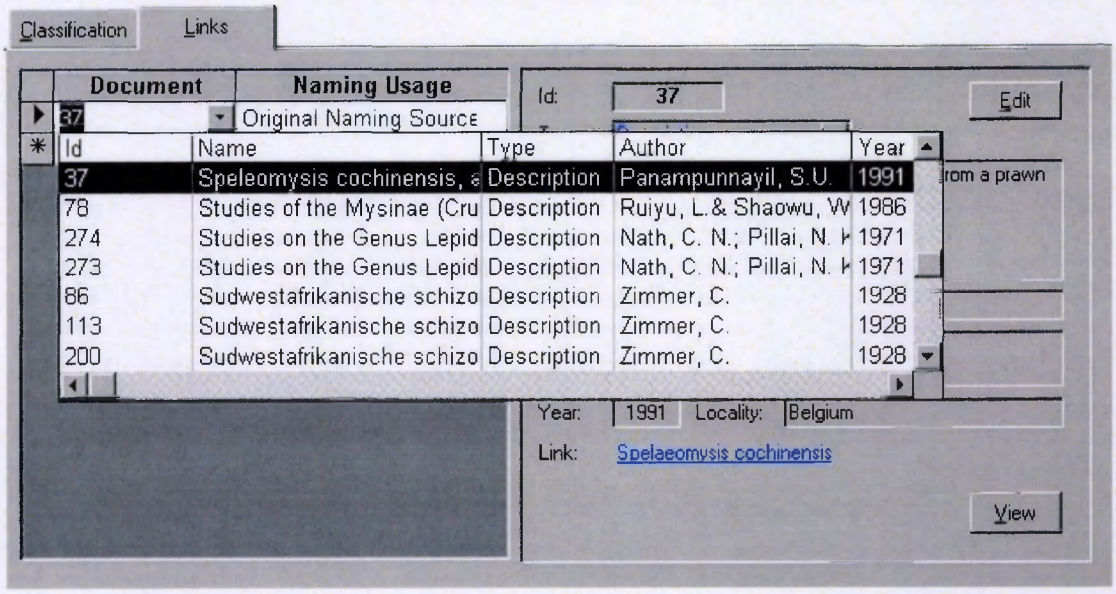


Figure 47. Example of the scroll list in the species-link tab

6.10 Example of the scroll list in the record-link tab

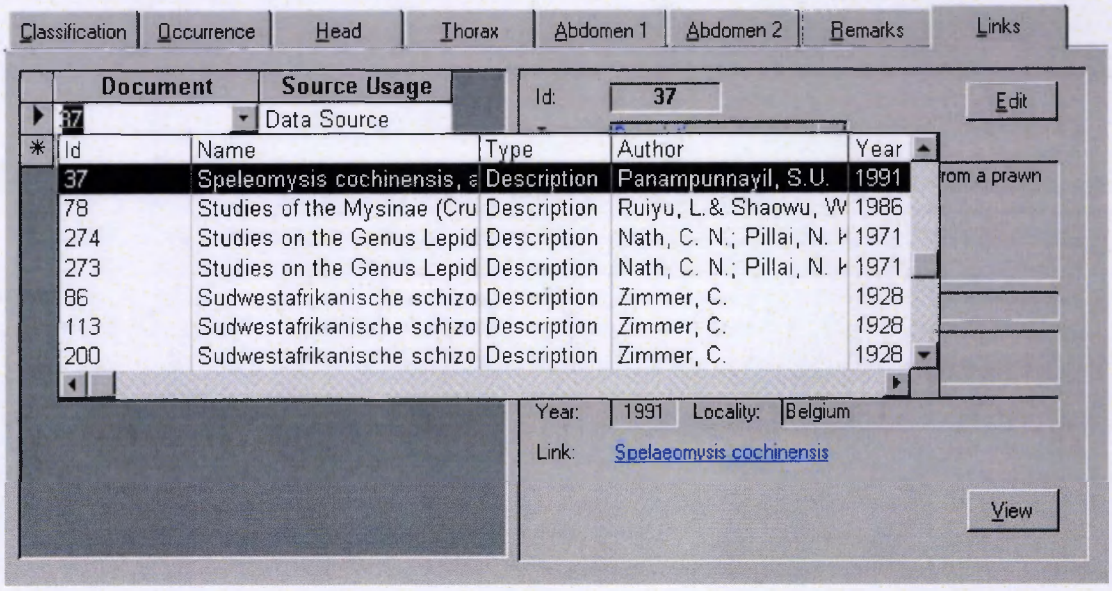
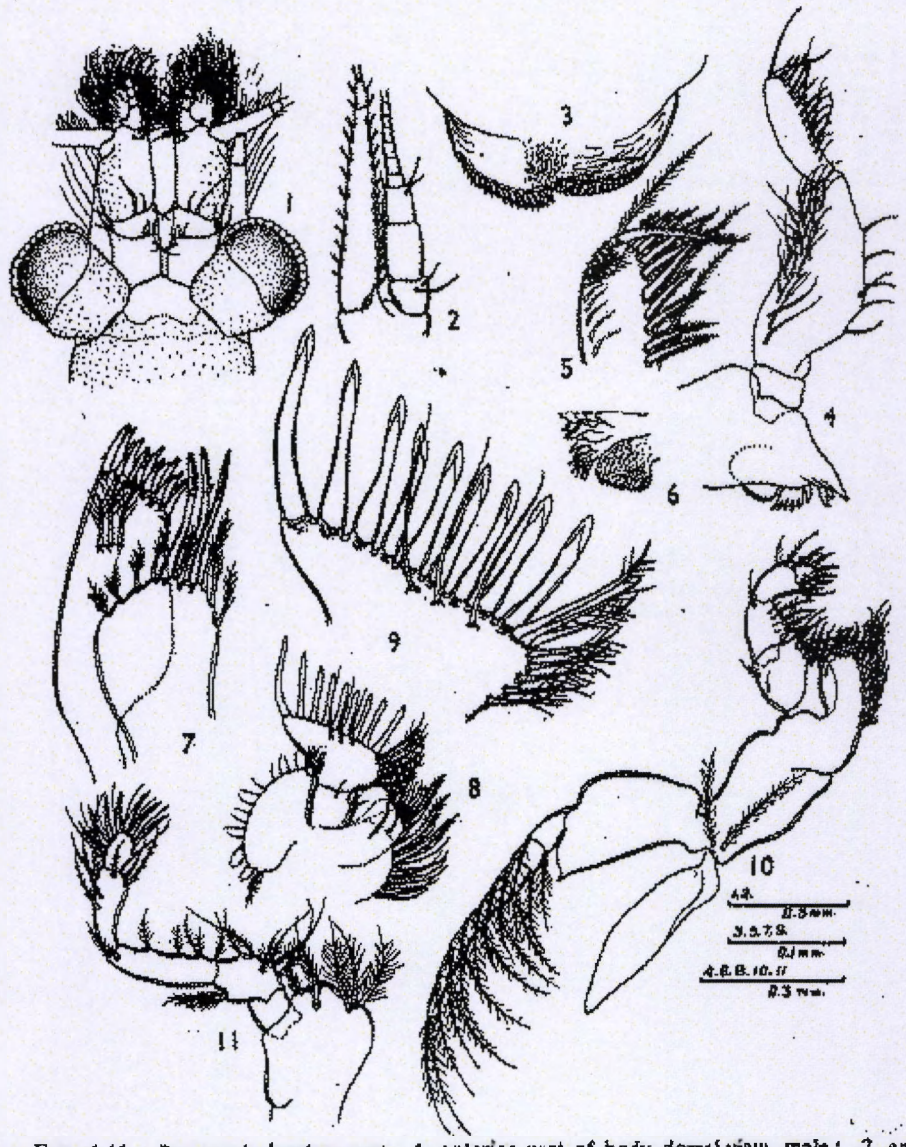


Figure 48. Example of the scroll list in the record-link tab

6.11 Example of a scanned document

a sharp outer spine, exopod is lanceolate, fully setose and does not reach the tip of the antennular peduncle, endopod has a three-segmented peduncle nearly half as long as the scale. Labrum is only slightly asymmetrical, the asymmetry is, however, increased by the dissimilar armature of the two halves. Mandible has a well developed cutting edge, palp is stout and prominently setose, second segment is very large.



FIGS. 1-11. *Doxomysis longiura* n.sp. 1. anterior part of body, dorsal view, male; 2. antenna; 3. labrum; 4. mandible; 5. same, tip of palp; 6. same, cutting edge; 7. maxillule; 8. maxilla; 9. same, tip of endopod; 10. first thoracic appendage; 11. second thoracic appendage.

Figure 49. Example of a page from a scanned document

6.12 Example of the classification tree

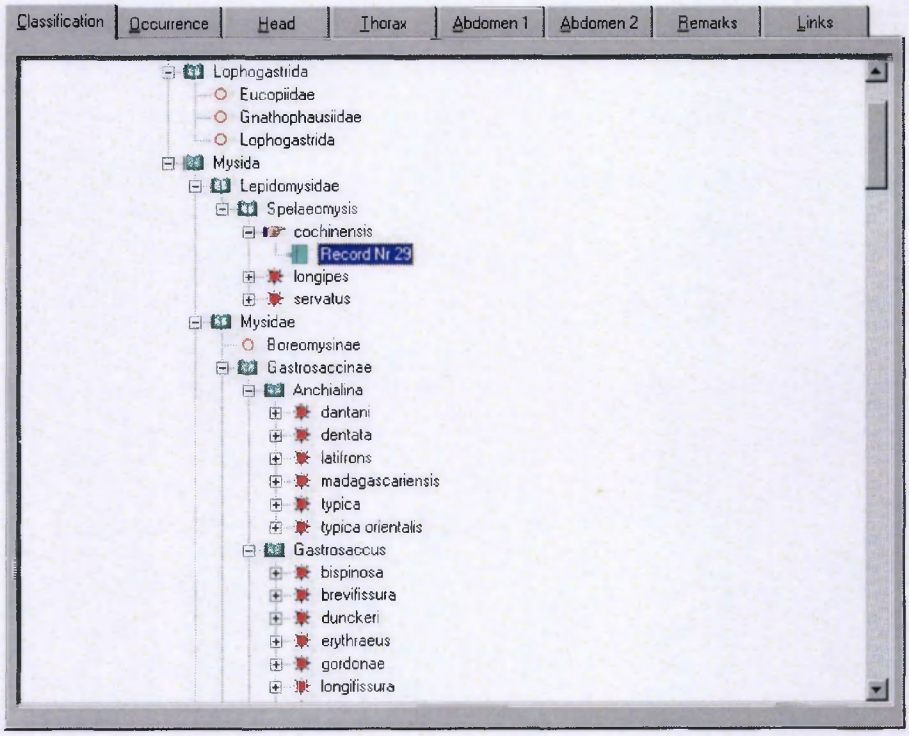


Figure 50. Example of the 'Classification tree' in the editing form

6.13 Example of the occurrence tab

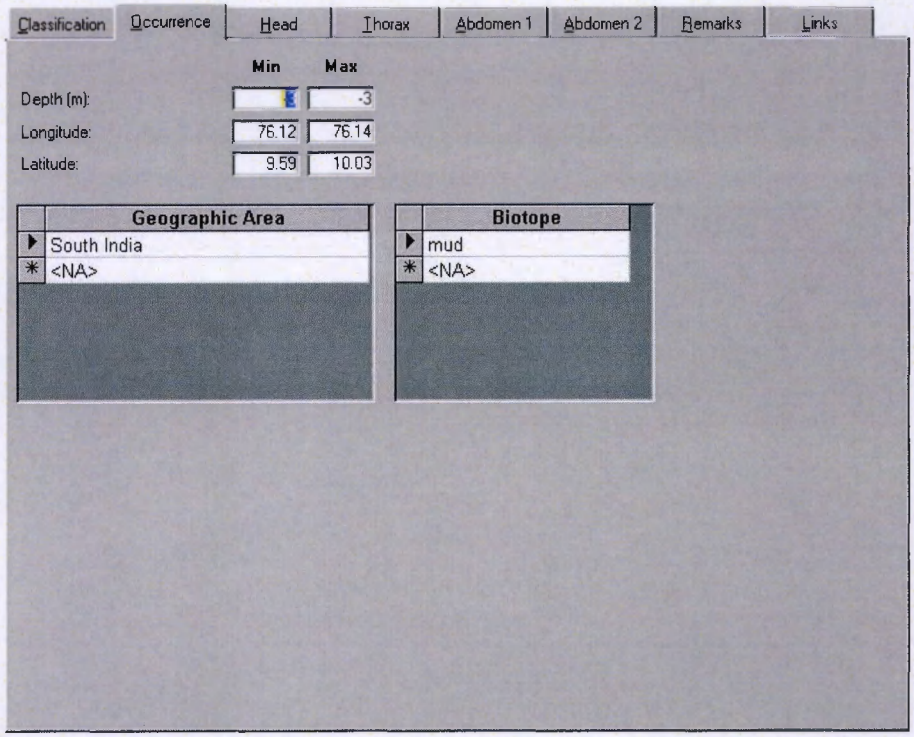


Figure 51. Example of the 'occurrence' Tab in the editing form

6.14 Example of the head tab

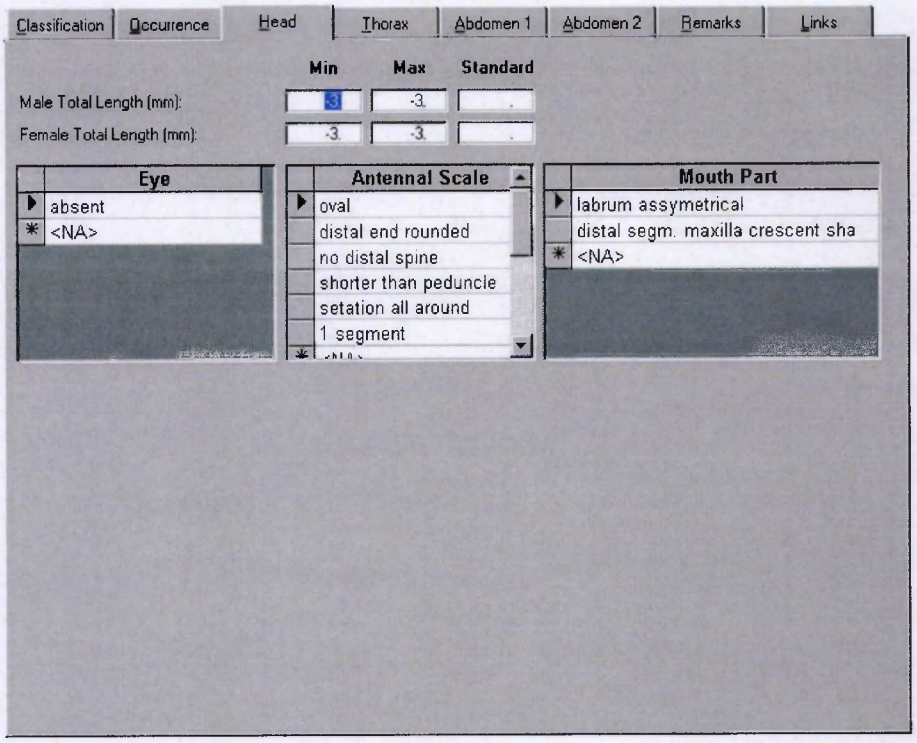


Figure 52. Example of the 'head' tab

6.15 Example of the thorax tab

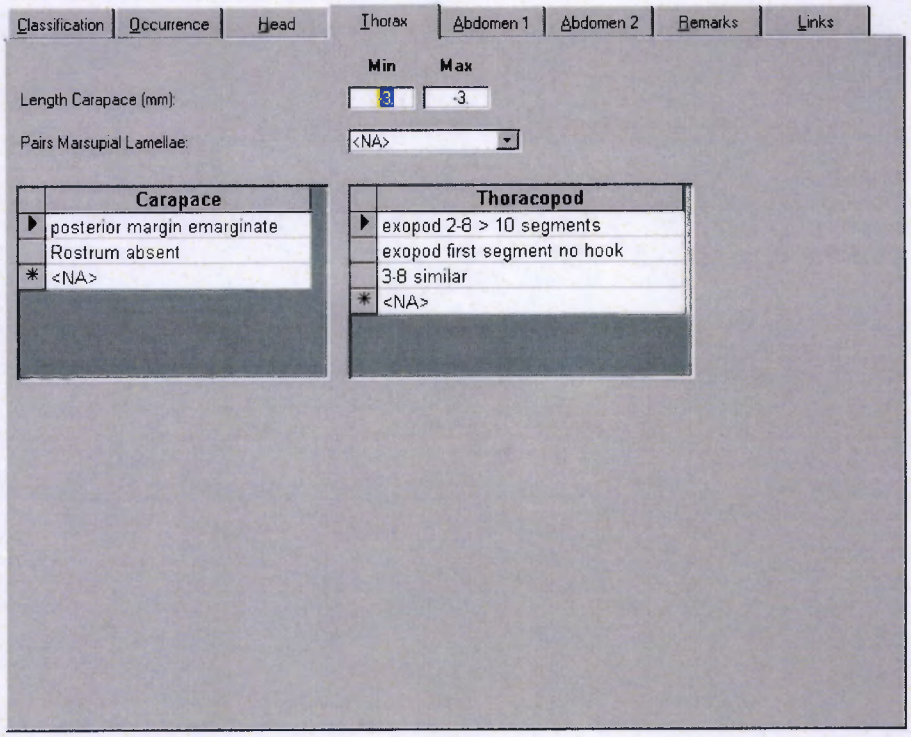


Figure 53. Example of the 'thorax' tab

6.16 Example of the Abdomen1 tab

Classification | Occurrence | Head | Thorax | Abdomen 1 | Abdomen 2 | Remarks | Links

Female:	Rami	Exopod Segm.	Endopod Segm.	Morphological Features
First Pleopod:	<NA>	<NA>	<NA>	<NA>
Second Pleopod:	<NA>	<NA>	<NA>	<NA>
Third Pleopod:	<NA>	<NA>	<NA>	<NA>
Fourth Pleopod:	<NA>	<NA>	<NA>	<NA>
Fifth Pleopod:	<NA>	<NA>	<NA>	<NA>

Male:	Rami	Exopod Segm.	Endopod Segm.	Morphological Features
First Pleopod:	Biramous	3 segments	1 segments	<NA>
Second Pleopod:	Biramous	3 segments	1 segments	<NA>
Third Pleopod:	Biramous	3 segments	1 segments	<NA>
Fourth Pleopod:	Biramous	3 segments	1 segments	<NA>
Fifth Pleopod:	Biramous	3 segments	1 segments	<NA>

Figure 54. Example of the 'Abdomen1' tab

6.17 Example of the Abdomen2 tab

Classification | Occurrence | Head | Thorax | Abdomen 1 | Abdomen 2 | Remarks | Links

Statocyst: Absent

	Min	Max
Nr Spines Exopod:	32	32
Nr Spines EndoPod:	0	0

Uropod
endopod shorter than exopod
suture on exopod
no suture on endopod
<NA>

Telson
entire
apex armed
lateral margins armed
apex rounded
linguiform
<NA>

	Min	Max
Nr SpinesTelson:	23	26
Nr SpinulesTelson:	0	0
Length ratio Telson (L/B):	1.9	

Figure 55. Example of the 'Abdomen2' tab

6.18 Examples of the remarks tab

6.18.1 Without template

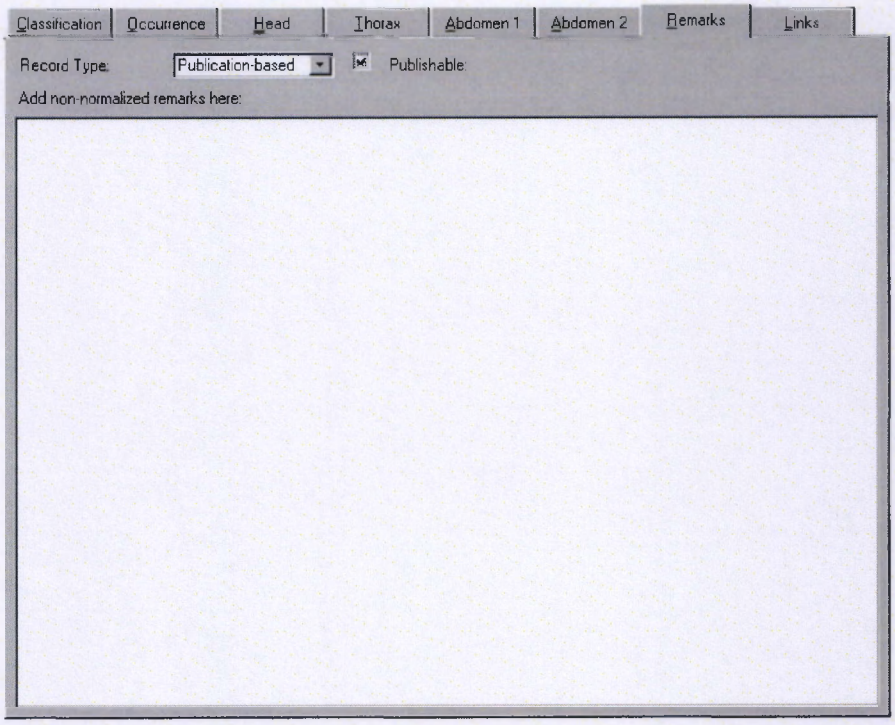


Figure 56. Example of the 'remarks' tab without template

6.18.2 With template

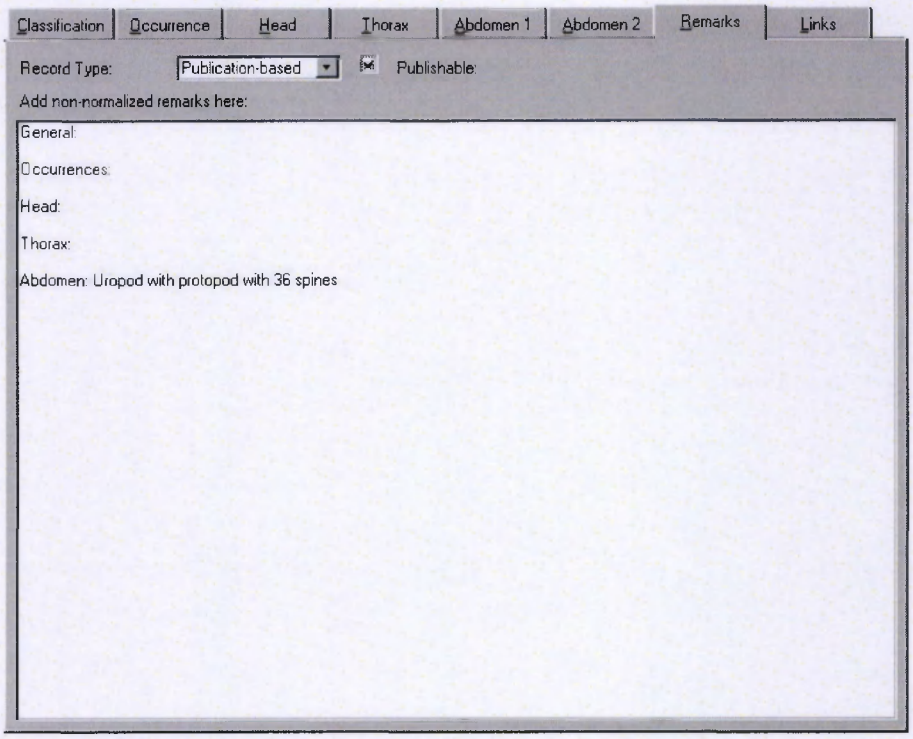


Figure 57. Example of the 'remarks' tab with template

6.19 Example of the document form

DOCUMENTS

Id: 1
Type: Description

Specifications
Title: Two new species of Anisomysis (Crustacea-Mysidacea) from the Lakshadweep archipelago.
Author: Panampunnayil, S.U.
Journal: Journal of Plankton Research 15: 1141-1148
Year: 1993
Locality: NA

Electronic Document relative to path c:\my documents\proces
Hyperlink: Anisomysis spinata#M1075.pdf# Edit View
Visual: Anisomysis spinata

Physical Document
Call Nr: M1075

Delete Clone Close
Record: 1 of 310

Figure 58. Example of the 'documents' form

6.20 Example of look-up table: antennal scales

TABLE MAINTENANCE

Issue
Choices for Antennal Scales (tblAntennalScales)
You can now edit this base table.
Be VERY carefull when removing records.

Id	Description
[	<NA>
1	absent
2	long and narrow
3	oval
4	rectangular
5	distal end rounded
6	distal end pointed
7	distal end flat
8	distal spine
9	no distal spine
10	shorter than peduncle

Print Close

Figure 59. Example of a look-up table

6.21 Example of look-up table: biotopes

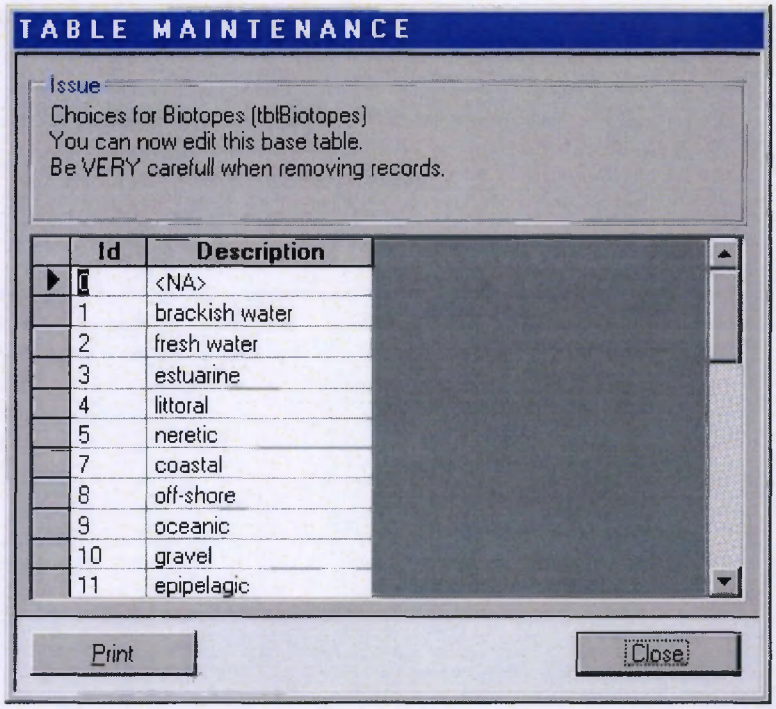


Figure 60. Example of a look-up table

6.22 Example of look-up table: carapaces

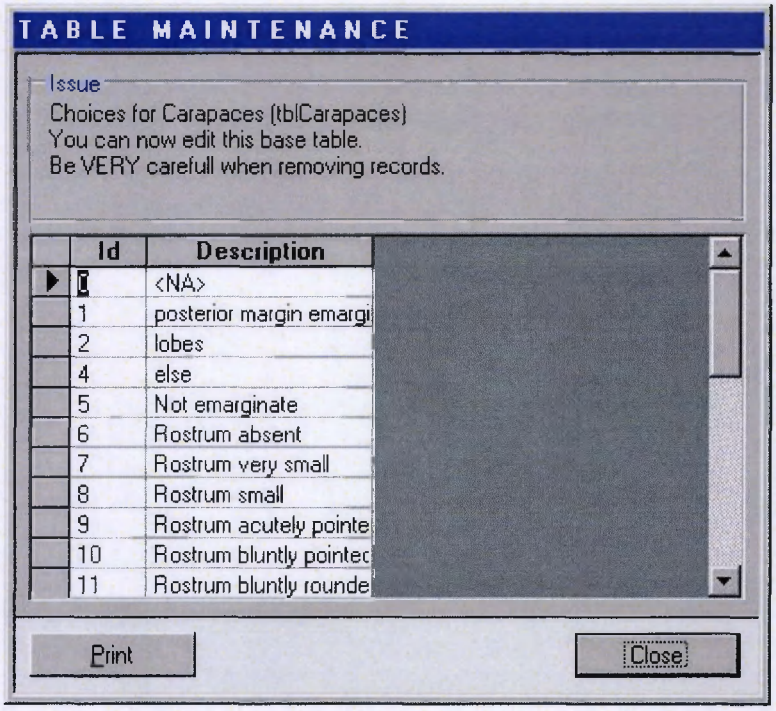


Figure 61. Example of a look-up table

6.23 Example of look-up table: eyes

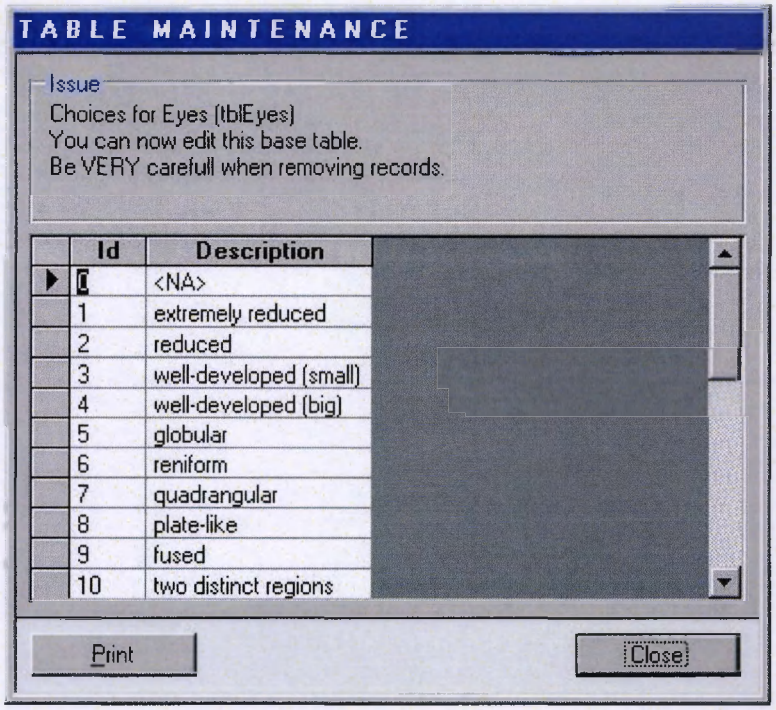


Figure 62. Example of a look-up table

6.24 Example of look-up table: pleopod features

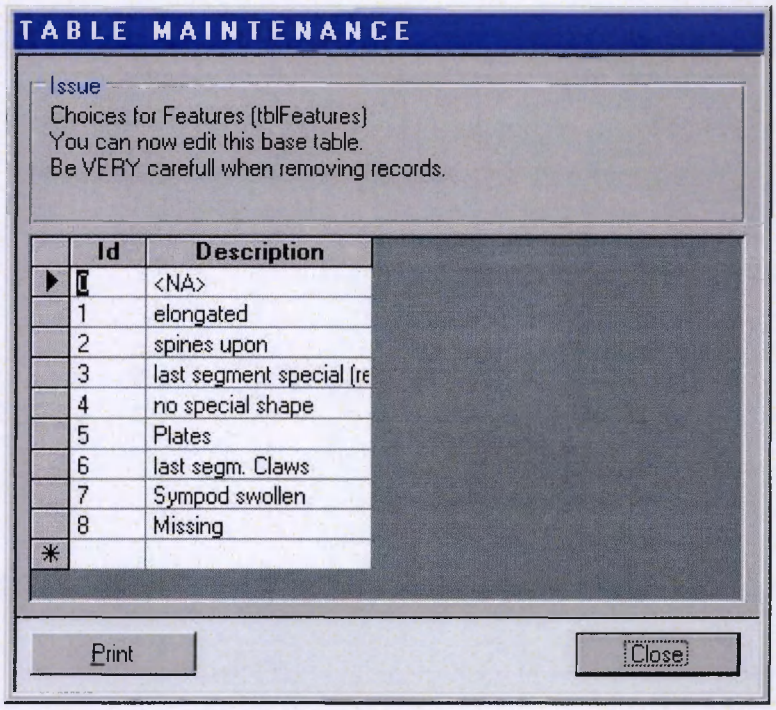


Figure 63. Example of a look-up table

6.25 Example of look-up table: geographic regions

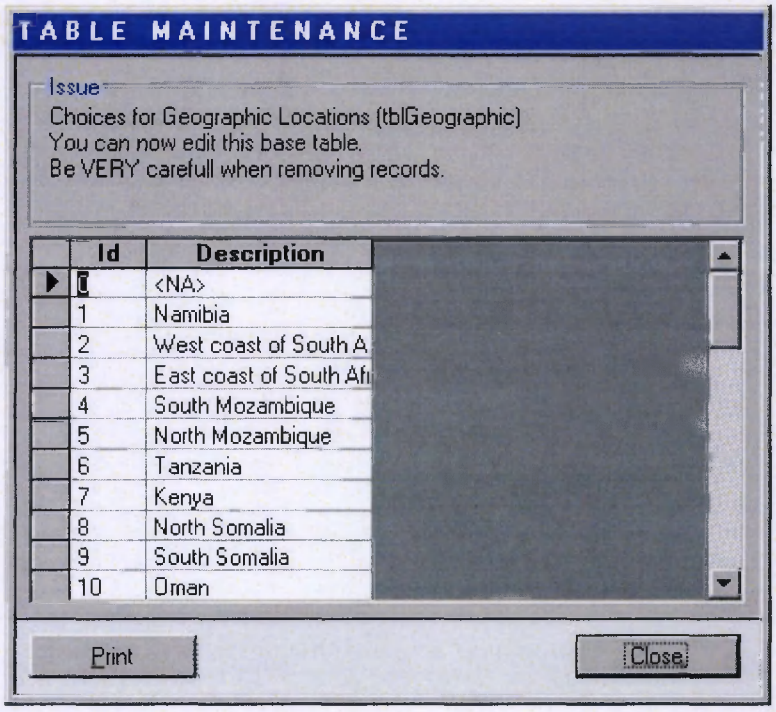


Figure 64. Example of a look-up table

6.26 Example of a document check

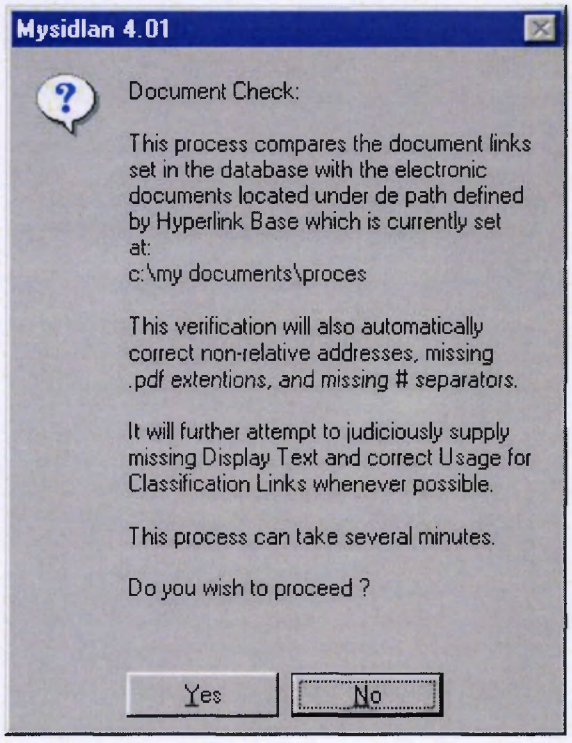


Figure 65. Example of the first 'document check' form

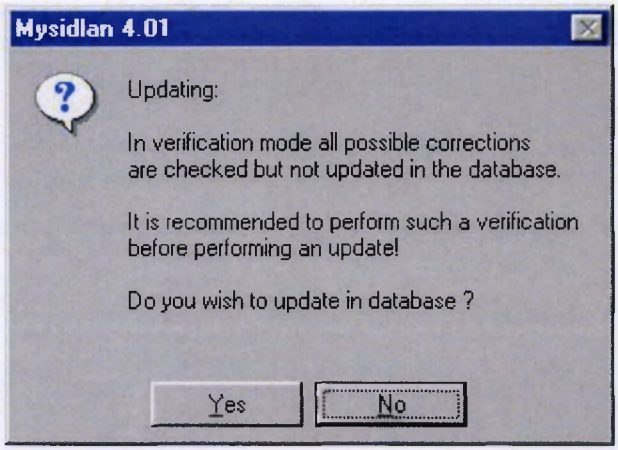


Figure 66. Example of the second 'document check' form

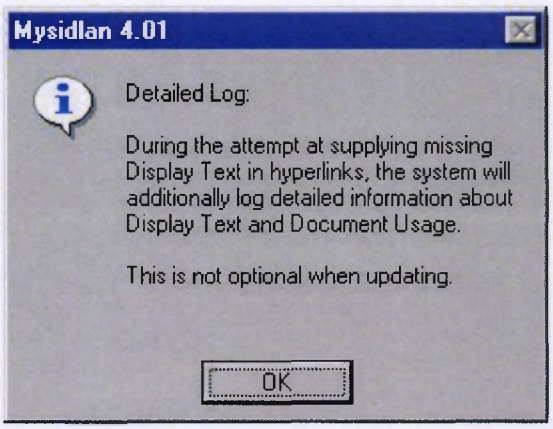


Figure 67. Example of the third 'document check' form

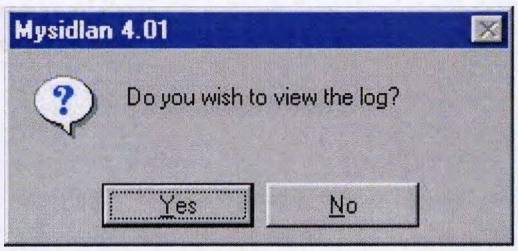


Figure 68. Example of the fourth 'document check' form

7. OCCURRENCE

☞ Geography
This page contains information on the different geographical regions used in the database.

☞ Habitat
This page contains information on the different types of habitats used in the database.

☞ Co-ordinates
This page contains information on the co-ordinates used in the part occurrence.

7.1 Geographical data

In the database Mysidlan, in the file mysiddat.mdb only the shallow-water species of the western Indian Ocean and surrounding areas are included. The data on geographical occurrence is split in two types of data: location-data (co-ordinates) and geographical data (regions). An overview of the study-area is given in the figure and further on in the list of the regions.

A second file mysidworld contains a species list of the world. The data for this list was obtained by the World species list of Muller (1993) with recent changes by Dr Jan Mees and Prof. Tris Wooldridge. The geographical distribution mentioned in the base list is based upon the regions Mauchline defined in his World list (1977). For this reason it was needed to add the world regions described in the article of Mauchline (1977). A map with the regions is given in Figure 69. The explanation of the codes used on the map are given in Table 33

Example of geography Tab Mysidlan on page 77.

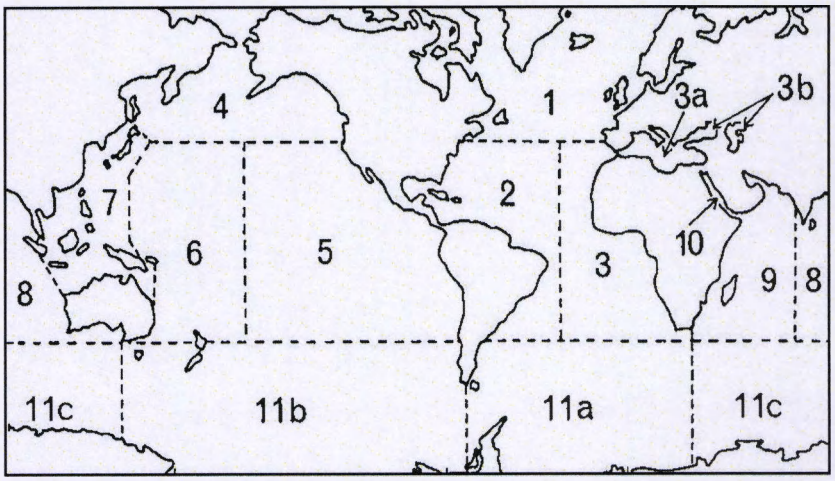


Figure 69. World map with indication of the biogeographical zones defined by Mauchline (1977)

Code	Description
1	'North Atlantic' (Noord Atlantische Oceaan)
2	'West Atlantic' (West Atlantische Oceaan)
3	'East Atlantic' (Oost Atlantische Oceaan)
3a	'Meditteranean' (Middellanse Zee)
3b	'Black Sea' (Zwarte Zee)
4	'North Pacific' (Noordelijke Stille Oceaan)
5	'East Pacific' (Oostelijke Stille Oceaan)
6	'West Pacific' (Westelijke Stille Oceaan)
7	'Australasian' (Australisch-Aziatische regio)
8	'Eastern Indian Ocean' (Oostelijke Indische Oceaan)
9	'Western Indian Ocean' (Westelijke Indische Oceaan)
10	'Red Sea' (Rode Zee)
11a	'South Atlantic' (Zuid Atlantische Oceaan)
11b	'South Pacific' (Zuidelijke Stille Oceaan)
11c	'Southern Indian Ocean' (Zuidelijke Indische Oceaan)

Table 33. Explanation of geographical codes used in Figure 69

Figure 70. Map of the area of the Western Indian Ocean

7.1.1 List of regions

There are different geographical regions. They consist of islands, coastlines and seas. The different regions are illustrated on the map. A list of the subregions is included in the table below.

Region	Location on the map
Namibia	A
West-coast of South Africa	B
East-coast of South Africa	C
South Mozambique	D
North Mozambique	E
Tanzania	F
Kenya	G
North Somalia	H
South Somalia	I
Oman	J
Pakistan	K
North India	L
South India	M
Persian Gulf	N
Gulf of Oman	O
Red Sea	P
Gulf of Aden	Q
West Madagascar	R
East Madagascar	S
Comores	T
Zanzibar	U
Maldives	V
Laccadives	W
Mauritius	X
Reunion	Y
Seychelles	Z

Table 34. List of regions included in Mysidlan

Most of the subregions are areas with a known border, mostly the state borders. Some countries' coastlines were divided in subregions. This division was made so that all the subregions represent an area of almost the same surface. In this way it is possible to compare the different subregions. It is important to define the edges of each subregion.
Every subregion is defined as precisely as possible. The co-ordinates of the borders of each region the borders are given, and if possible also the corresponding geographical place. In each case the co-ordinates and geographical places are these referring to the place, which is

located upon the coastline and on the border of the region, unless stated otherwise. The data was found in Microsoft Encarta 97 World Atlas.

7.1.1.1 Namibia

A:	Co-ordinates:	17° 16'	S
		11° 46'	E
	Geographical:	Foz do Cunerie	
B:	Co-ordinates:	28° 38'	S
		16° 27'	E
	Geographical:	Alexander Bay	

Figure 71. Map of the Namibian region

7.1.1.2 West South Africa

A:	Co-ordinates:	28° 38'	S
		16° 27'	E
	Geographical:	Alexander Bay	
B:	Co-ordinates:	33° 59'	S
		25° 32'	L
	Geographical:	Port Elizabeth	

Figure 72. Map of the West Coast of South Africa

7.1.1.3 East South Africa

A:	Co-ordinates:	33° 39'	S
		25° 32'	E
	Geographical:	Port Elizabeth	
B:	Co-ordinates:	26° 52'	S
		32° 52'	E
	Geographical:	Kosi, Lopes	

Figure 73. Map of the East Coast of South Africa

7.1.1.4 South Mozambique

A:	Co-ordinates:	26° 52'	S
		32° 52'	E
	Geographical:	Kosi, Lopes	
B:	Co-ordinates:	19° 17'	S
		35° 33'	E
	Geographical:	Machesse	

Figure 74. Map of the South coast of Mozambique

7.1.1.5 North Mozambique

A:	Co-ordinates:	19° 17'	S
		35° 33'	E
	Geographical:	Machesse	
B:	Co-ordinates:	10° 29'	S
		40° 26'	E
	Geographical:	Rio Lugenda (River)	

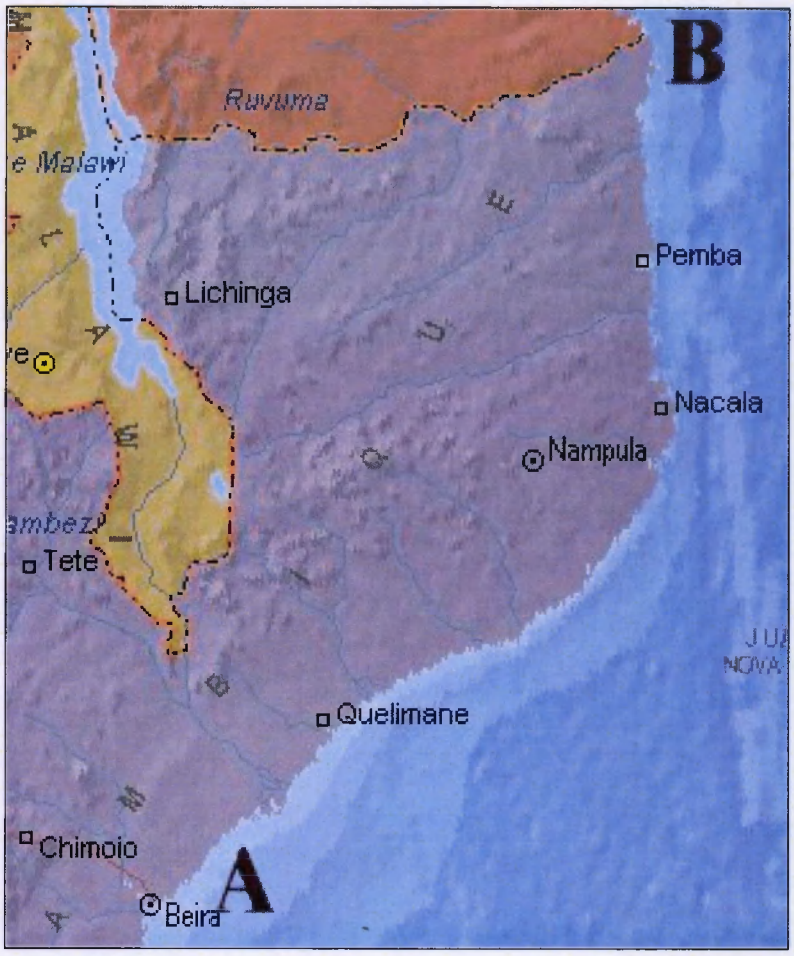


Figure 75. Map of the North coast of Mozambique

7.1.1.6 Tanzania

A:	Co-ordinates:	10° 29'	S
		40° 26'	E
	Geographical:	Rio Lugenda (River)	
B:	Co-ordinates:	4° 41'	S
		39° 13'	E
	Geographical:	Kendwa, Mguya	

Figure 76. Map of the coast of Tanzania

Remark: The coast of the island Zanzibar is not included in the Tanzanian region.

7.1.1.7 Kenya

A:	Co-ordinates:	4° 41'	S
		39° 13'	E
	Geographical:	Kendwa, Mguya	
B:	Co-ordinates:	1° 39'	S
		41° 43'	E
	Geographical:	Kaambooni	

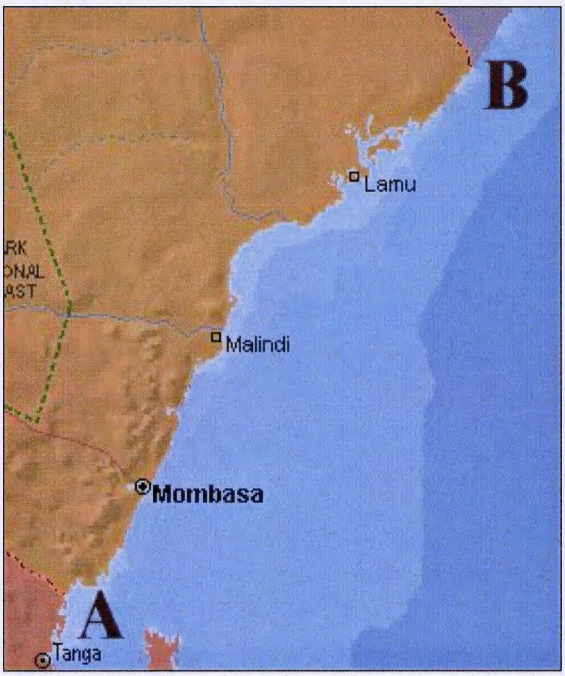


Figure 77. Map of the coast of Kenya

7.1.1.8 North Somalia

B:	Co-ordinates:	5° 20'	N
		48° 30'	E
	Geographical:	Hobyo	
C:	Co-ordinates:	11° 50'	N
		51° 17'	E
	Geographical:	~ Damo	

Figure 78. Map of the North Somalian region (B & C)

7.1.1.9 South Somalia

A:	Co-ordinates:	1° 39'	S
		41° 43'	E
	Geographical:	Kaambooni	
B:	Co-ordinates:	5° 20'	N
		48° 30'	E
	Geographical:	Hobyo	

Figure 79. Map of the South Somalian region (A-B)

7.1.1.10 Oman

A:	Co-ordinates:	16° 38'	N
		53° 7'	E
	Geographical:	?	
B:	Co-ordinates:	22° 29'	N
		59° 49'	E
	Geographical:	Ra's al Hadd	

Figure 80. Map of the Oman region

7.1.1.11 Pakistan

A:	Co-ordinates:	25° 2'	N
		61° 45'	E
	Geographical:	Jiwani	
B:	Co-ordinates:	23° 46'	N
		68° 1'	E
	Geographical:	Kadjar Creek	

Figure 81. Map of the Pakistani region

7.1.1.12 North India

A:	Co-ordinates:	23° 46'	N
		68° 1'	E
	Geographical:	Kadjar Creek	
B:	Co-ordinates:	15° 52'	N
		73° 37'	E
	Geographical:	Venguria	

Figure 82. Map of the North Indian region

7.1.1.13 South India

A:	Co-ordinates:	15° 52'	N
		73° 37'	E
	Geographical:	Venguria	
B:	Co-ordinates:	8° 04'	N
		77° 33'	E
	Geographical:	Kammiyäkumari	

Figure 83. Map of the South Indian region

7.1.1.14 Persian Gulf

A:	Co-ordinates:	27° 11'	N
		56° 17'	E
	Geographical:	Bandäre Abäs	
B:	Co-ordinates:	26° 21'	N
		56° 27'	E
	Geographical:	Ra's Musandam	

Figure 84. Map of the Persian Gulf region

7.1.1.15 Gulf of Oman

A:	Co-ordinates:	27° 11'	N
		56° 17'	E
	Geographical:	Bandäre Abäs	
B:	Co-ordinates:	26° 21'	N
		56° 27'	E
	Geographical:	Ra's Musandam	
C:	Co-ordinates:	22° 32'	N
		59° 48'	E
	Geographical:	Ra's al Hadd	
D:	Co-ordinates:	25° 2'	N
		61° 45'	E
	Geographical:	Jiwani	

Remark: The NorthEast border is taken on the East Side of the estuary of the river Dasht. In this way the estuarine habitat is not divided in two parts.

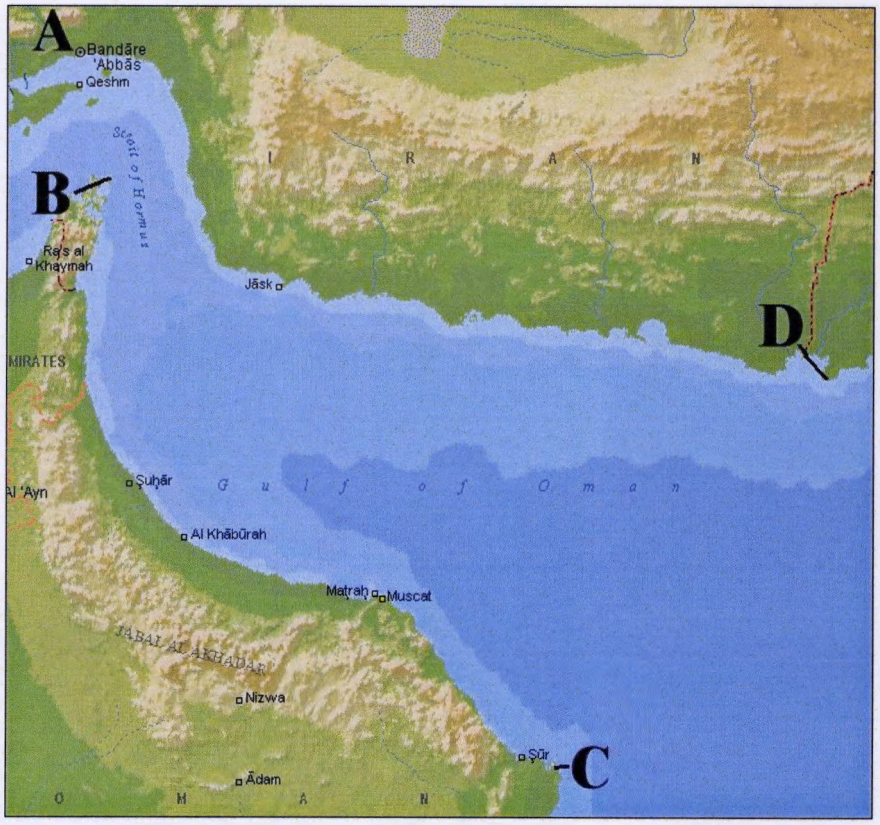


Figure 85. Map of the Gulf of Oman region

7.1.1.16 Red Sea

A:	Co-ordinates:	12° 40'	N
		43° 28'	E
	Geographical:	Hisn Muräd	
B:	Co-ordinates:	12° 29'	N
		43° 19'	E
	Geographical:	Fagal	

Figure 86. Map of the Red Sea

7.1.1.17 Gulf of Aden

A:	Co-ordinates:	12° 40'	N
		43° 28'	E
	Geographical:	Hisn Muräd	
B:	Co-ordinates:	12° 29'	N
		43° 19'	E
	Geographical:	Fagal	
C:	Co-ordinates:	5° 20'	N
		48° 30'	E
	Geographical:	Hobyo	
D:	Co-ordinates:	15° 38'	N
		52° 14'	E
	Geographical:	Khaysayb	

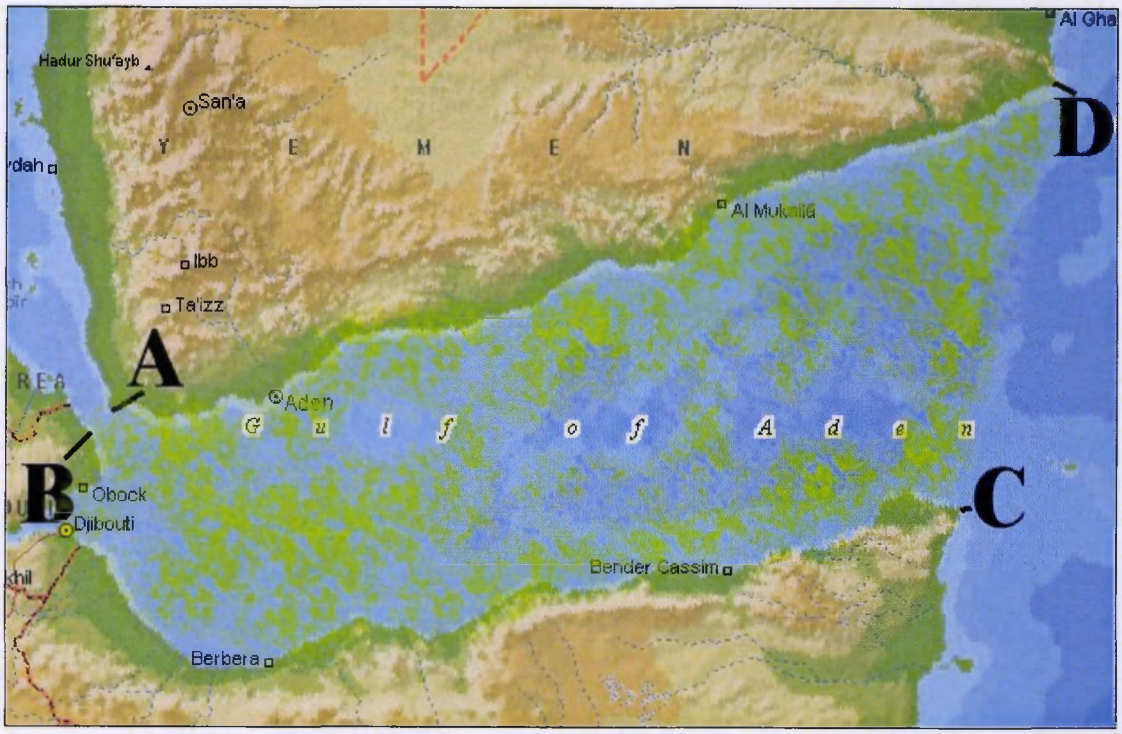


Figure 87. Map of the Gulf of Aden region

7.1.1.18 West Madagascar

A:	Co-ordinates:	12° 1'	S
		49° 19'	E
	Geographical:	Lotsohina	
B:	Co-ordinates:	25° 35'	S
		45° 17'	E
	Geographical:	Tratravitra	

Figure 88. Map of the West Madagascan region

7.1.1.19 East Madagascar

A:	Co-ordinates:	12° 1'	S
		49° 19'	E
	Geographical:	Lotsohina	
B:	Co-ordinates:	25° 35'	S
		45° 17'	E
	Geographical:	Tratravitra	

Figure 89. Map of the East Madagascan region

7.1.1.20 Comores

A:	Co-ordinates:	11° 17'	S
		43° 1'	E
B:	Co-ordinates:	13° 16'	S
		43° 1'	E
C:	Co-ordinates:	13° 16'	S
		45° 28'	E
D:	Co-ordinates:	11° 17'	S
		45° 28'	E

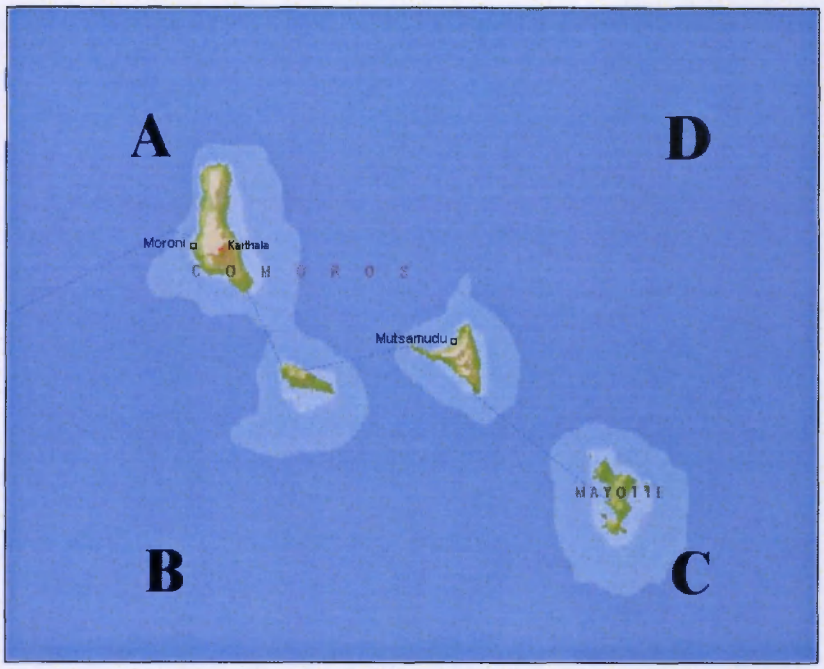


Figure 90. Map of the Comorian region

7.1.1.21 Zanzibar

A:	Co-ordinates:	5° 40'	S
		39° 7'	E
B:	Co-ordinates:	6° 7'	S
		39° 21'	E
C:	Co-ordinates:	6° 30'	S
		39° 17'	E
D:	Co-ordinates:	6° 30'	S
		39° 40'	E
E:	Co-ordinates:	5° 40'	S
		39° 27'	E

Remark: the co-ordinates in the table above give a relative identification of the codes on the map. This is due to the fact that all five points are located in the sea.

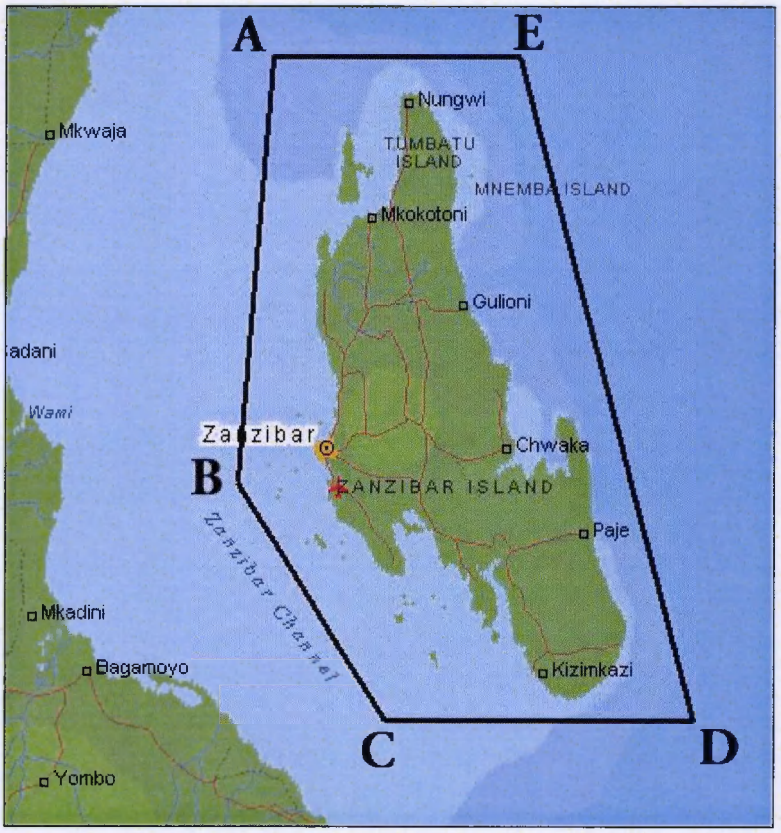


Figure 91. Map of the Zanzibar region

7.1.1.22 Maldives

A:	Co-ordinates:	7° 50'	N
		71° 20'	E
B:	Co-ordinates:	0°	N
		71° 50'	E
C:	Co-ordinates:	0°	N
		75°	E
D:	Co-ordinates:	7° 50'	N
		74° 70'	E

Remark: the co-ordinates in the table above give a relative identification of the codes on the map. This is due to the fact that all the four points are located in the sea.

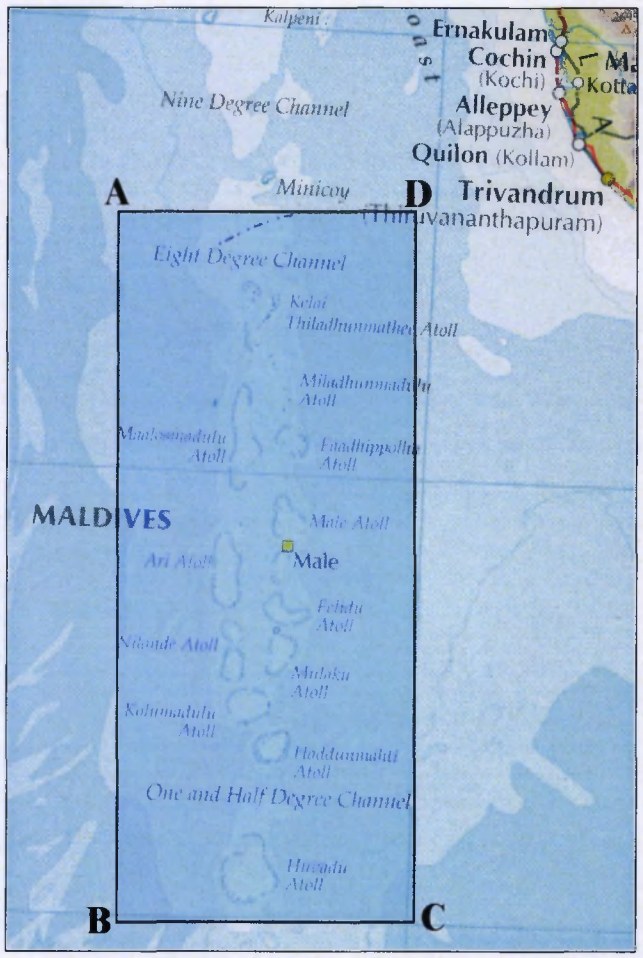


Figure 92. Map of the Maldivian region

7.1.1.23 Laccadives

A:	Co-ordinates:	12° 55'	N
		71°	E
B:	Co-ordinates:	8° 15'	N
		71°	E
C:	Co-ordinates:	8° 15'	N
		74° 20'	E
D:	Co-ordinates:	12° 55'	N
		73° 70'	E

Remark: the co-ordinates in the table above give a relative identification of the codes on the map. This is due to the fact that all the four points are located in the sea.

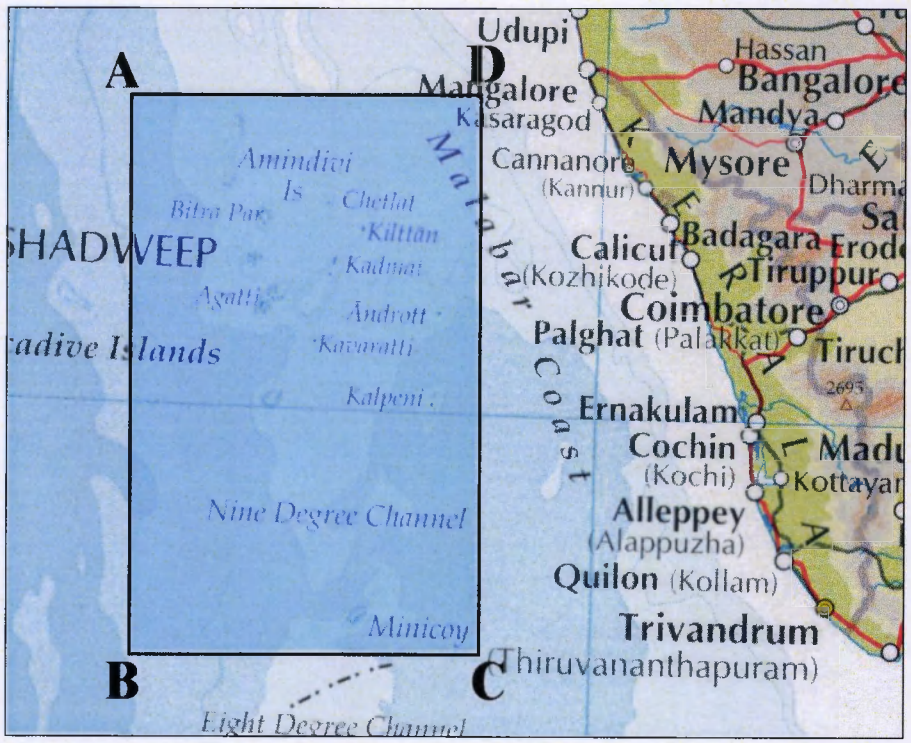


Figure 93. Map of Laccadivian region

7.1.1.24 Mauritius

A:	Co-ordinates:	19° 44'	S
		57° 12'	E
B:	Co-ordinates:	20° 34'	S
		57° 12'	E
C:	Co-ordinates:	20° 34'	S
		58°	E
D:	Co-ordinates:	19° 44'	S
		58°	E

Remark: the co-ordinates in the table above give a relative identification of the codes on the map. This is due to the fact that all the four points are located in the sea.

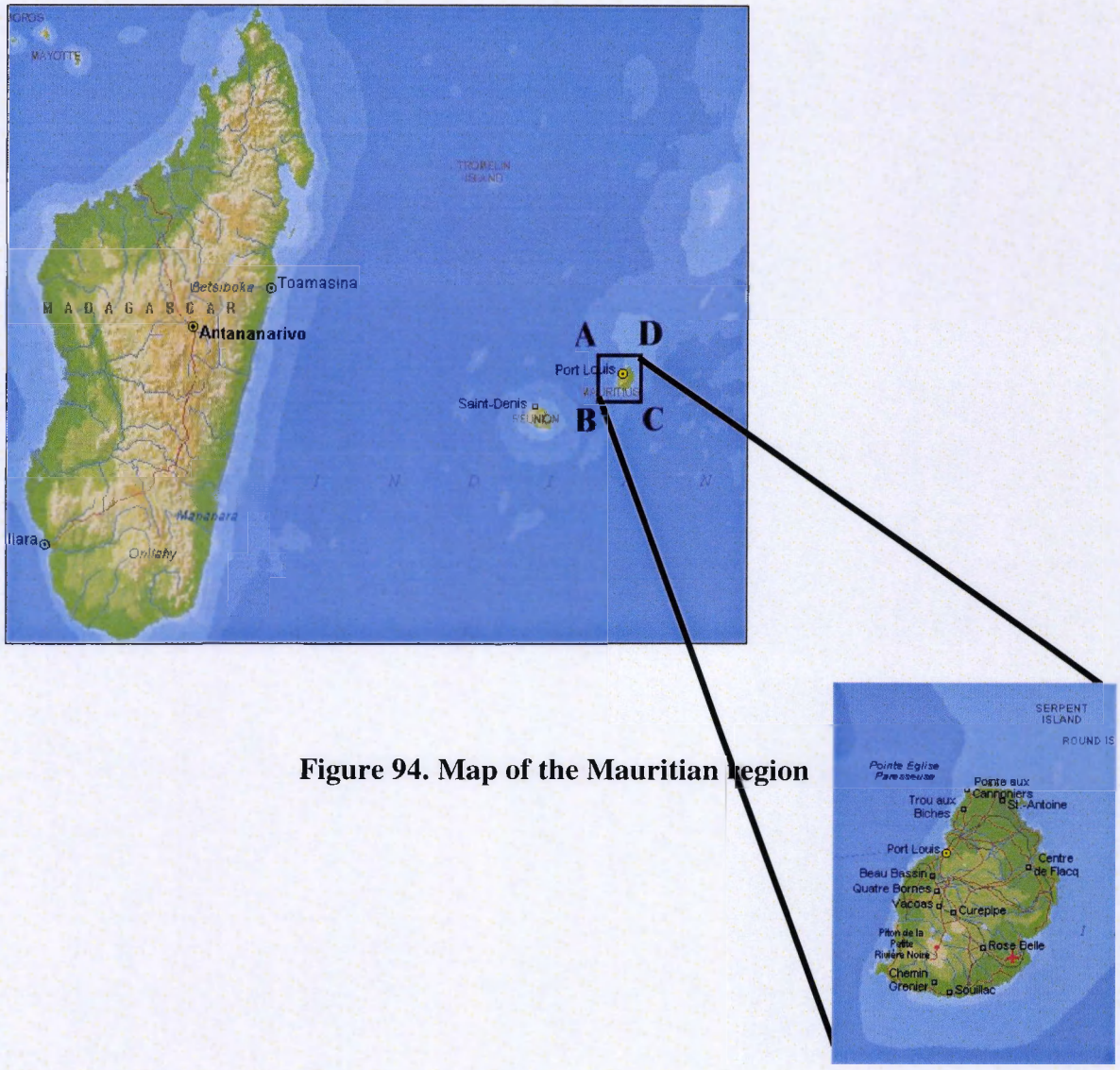


Figure 94. Map of the Mauritian region

7.1.1.25 Réunion

A:	Co-ordinates:	20° 38'	S
		54° 54'	E
B:	Co-ordinates:	21° 38'	S
		54° 54'	E
C:	Co-ordinates:	21° 38'	S
		56° 9'	E
D:	Co-ordinates:	20° 38'	S
		56° 9'	E

Remark: the co-ordinates in the table above give a relative identification of the codes on the map. This is due to the fact that all the four points are located in the sea.

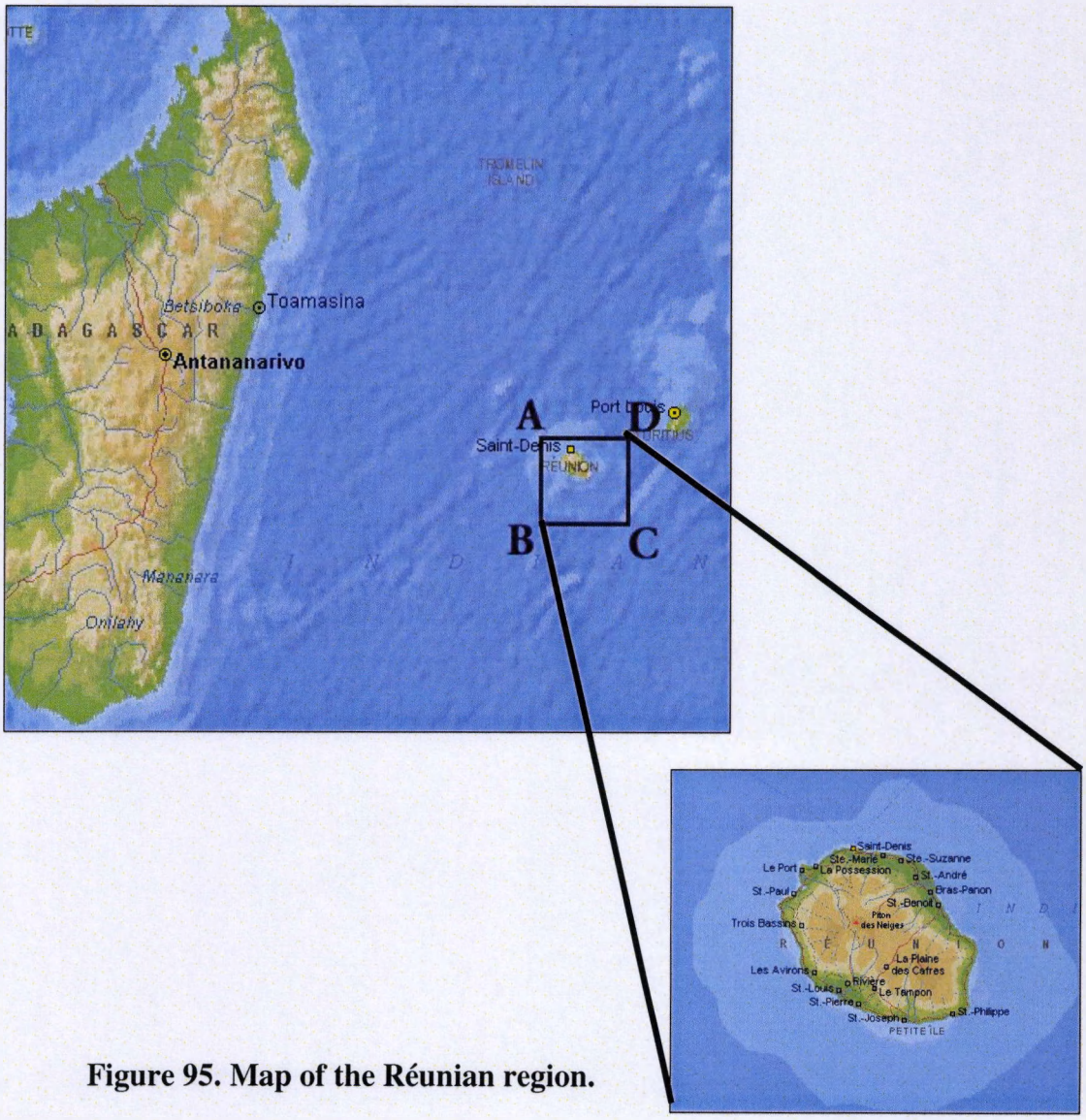


Figure 95. Map of the Réunian region.

7.1.1.26 Seychelles

A:	Co-ordinates:	3° 37'	S
		54° 42'	E
B:	Co-ordinates:	5° 09'	S
		54° 42'	E
C:	Co-ordinates:	5° 09'	S
		56° 22'	E
D:	Co-ordinates:	3° 37'	S
		56° 22'	E

Remark: all four points in the table to the left are in the sea; hence there are no corresponding geographical names.

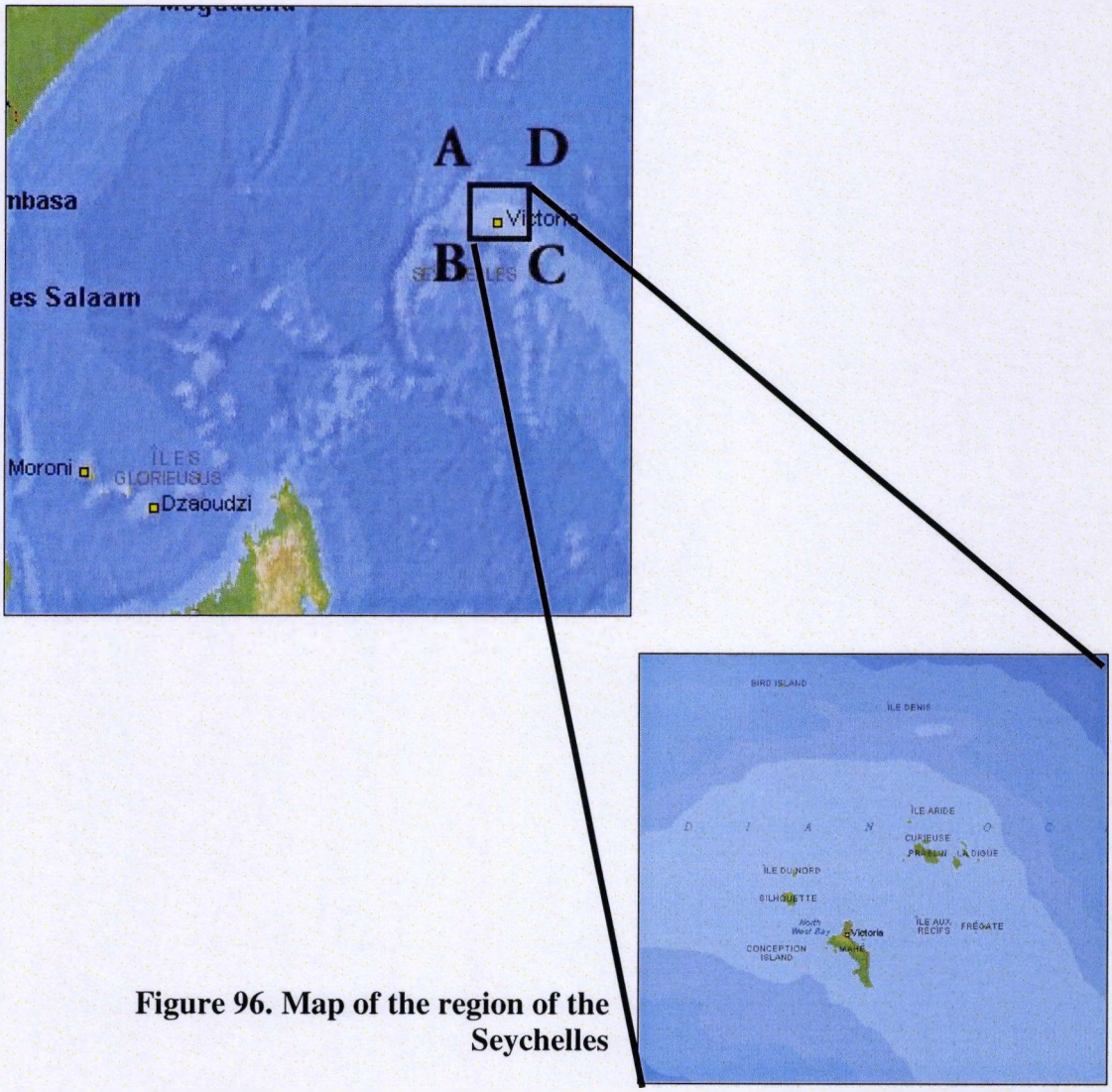


Figure 96. Map of the region of the Seychelles

7.2 Co-ordinates

The co-ordinates specified in the four fields on longitude and latitude, define a rectangle which shows the exact location where the species was found.

7.2.1 Values of the coordinates

The co-ordinates entered in the database are positive for east of Greenwich and north of the equator, negative for south and west, as illustrated in Figure 97 and Figure 98.

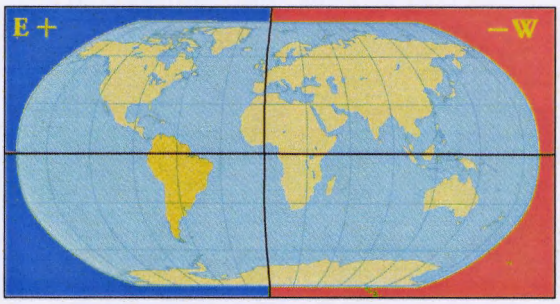


Figure 97. Meaning of the longitude values

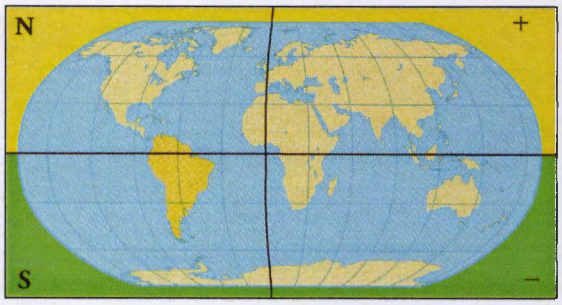


Figure 98. Meaning of the latitude values

7.3 Habitat

The term habitat is referring to the typical living environment of a species.
There are two types of data concerning the habitat of the animal in Mysidlan: depth and biotope information.

7.3.1 Depth

In the database Mysidlan only the shallow-water coastal species are included. There are possibilities that the species also occur in other regions. The maximum depth taken in this database was 50m below sea level. So all the species occurring in the shallow-water zone of the described regions that occur between surface and 50m depth are represented in the database.

7.3.2 Biotope

7.3.2.1 General

In Mysidlan there is also a possibility to include habitat information. Together with depth, this information gives an idea of the typical ecology of the species. The types of habitats were grouped into a number of types, which are defined more in detail below. There is a possibility in the database to mark more than one biotope out of the list.

Habitat-types
<NA>
Brackish water
Fresh water
Estuarine
Littoral
Neretic
Subtidal
Coastal
Off-shore
Oceanic
Epipelagic
Mesopelagic
Bathypelagic
Commensal
Crab-holes
Rocks
Gravel
Sand
Mud
Clay
Reefs
Weeds

Table 35. List of habitat types

7.3.2.2 Detail

Much more information than what is presented below is known about the habitat of mysids. Sources can be found in the References section.

A. Brackish water To habitat list

Brackish water is water that is more saline than freshwater but less than the open sea. Very often, brackish water environments are also fluctuating environments. The salinity is variable depending on the tide, the amount of freshwater entering from rivers or as rain, and the rate of evaporation. As a result many brackish water mysids are tolerant of changes in salinity.
Information from http://www.aquariacentral.com/faqs/brackish/

B. Fresh water To habitat list

Fresh water is water with low salinity. The salinity is the total concentration of the ions and is usually computed from the sodium, potassium, magnesium, calcium, carbonate, silicate, and halide concentrations. In the figure below the relationship between salinity and oxygenation in fresh water and seawater is shown.

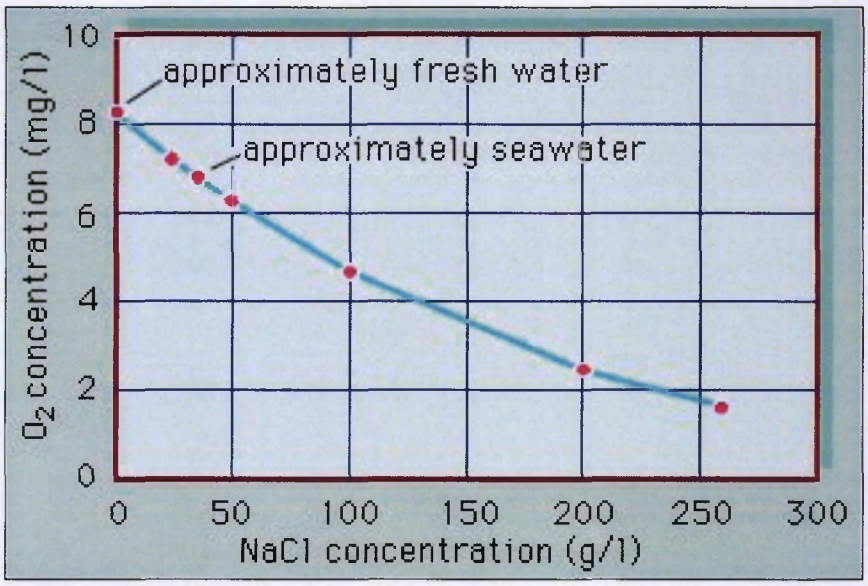


Figure 99. Illustration of the relationship between oxygenation and salinity in water (data from http:\www.britanica.com)

C. Estuarine

To habitat list

Estuaries can be defined as semi-enclosed bodies of coastal water which retain free connection with the open sea and within which sea water is measurably mixed with fresh water of terrestrial origin (Pritchard, 1967).
There are several types of estuaries but these are not specified in the database. Species that live in estuarine systems mostly have physiological adaptations to the environmental characteristics. Estuaries are characterised by high differences in salinity and temperature. This has an influence on the osmoregulation within animals living in these environments. More information concerning ecology and physical characteristics can be found in more specialised literature. A list of works is given in the literature-list at the end.

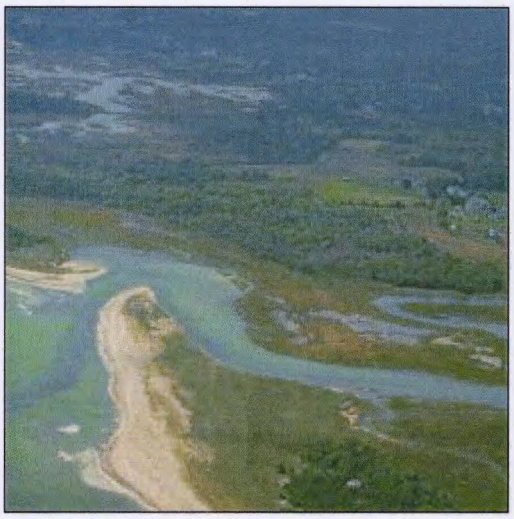


Figure 100. View of an estuary

D. Littoral

To habitat list

This term refers to an indefinite zone extending seaward from the shoreline to just beyond the breaker zone. This zone has most tidal influence.

E. Neretic

To habitat list

This term is referring to the type of water that is overlaying the continental shelf, generally up to a depth of less than 200m.

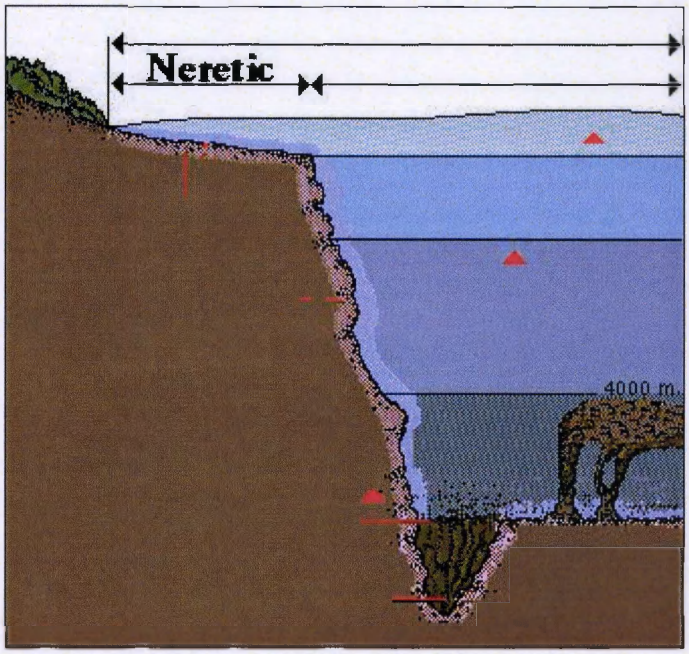


Figure 101. Schematic view of the neretic zone

F. Subtidal

To habitat list

The part of the coast that never gets dry, not even in spring tide. This is shown in the figure below.

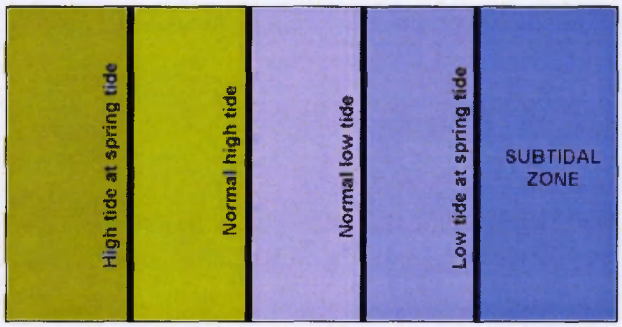


Figure 102. Illustration of the subtidal zone

G. Coastal

To habitat list

This term refers to the zone of the sea body that is closest to the land bodies.

H. Off-shore

To habitat list

This term refers to the zone out of the coast. This means the zone deeper than 50 m not defined as oceanic.

I. Oceanic

To habitat list

This term is referring to the waters beyond the shelf break, generally of depth greater than 200 m.

J. Epipelagic

To habitat list

This term refers to the zone in the water column that is situated in the first 200m. In other words the epipelagic zone is the zone between surface and 200m depth.

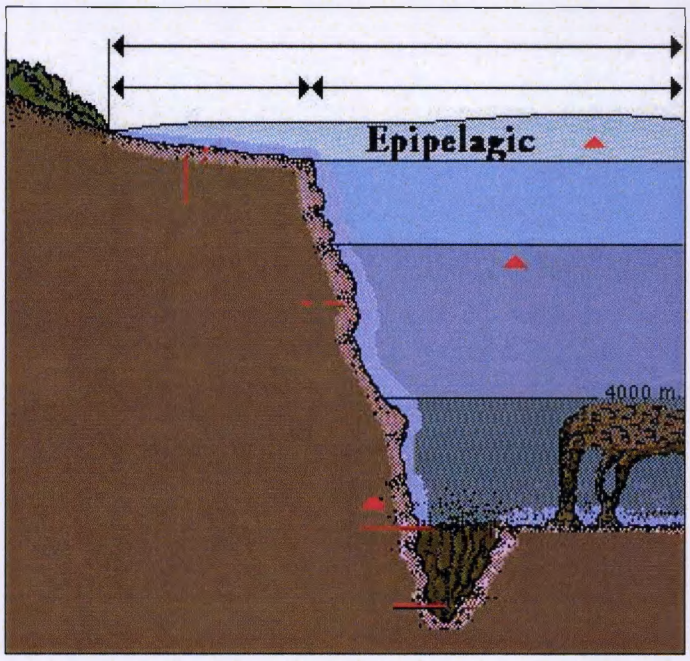


Figure 103. Schematic view of the epipelagic zone

K. Mesopelagic

To habitat list

This term refers to the zone in the water column that is situated between 200 and 1000m depth. The species in the database do all occur in the epipelagic zone (up to 50m depth) but some of these species also occur in deeper environments.

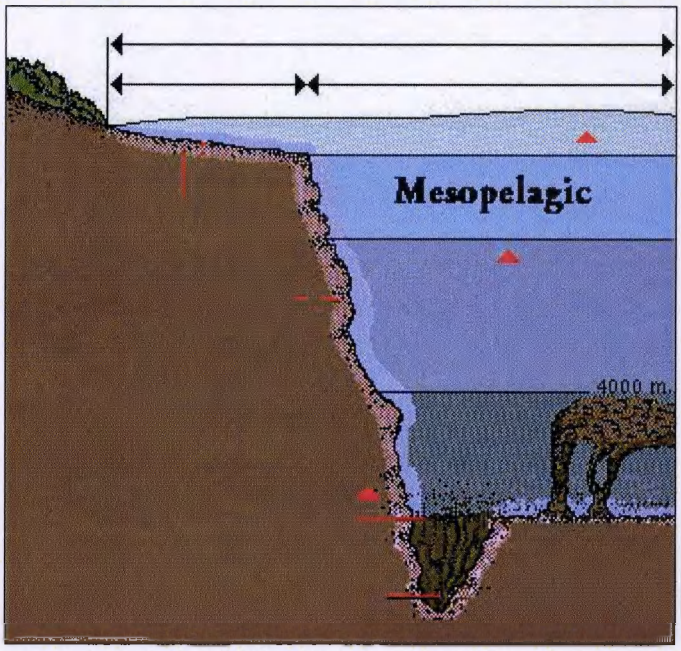


Figure 104. Schematic view of the mesopelagic zone

L. Bathypelagic

To habitat list

This term refers to the zone in the water column that is situated between 1000 and 4000m below the surface.

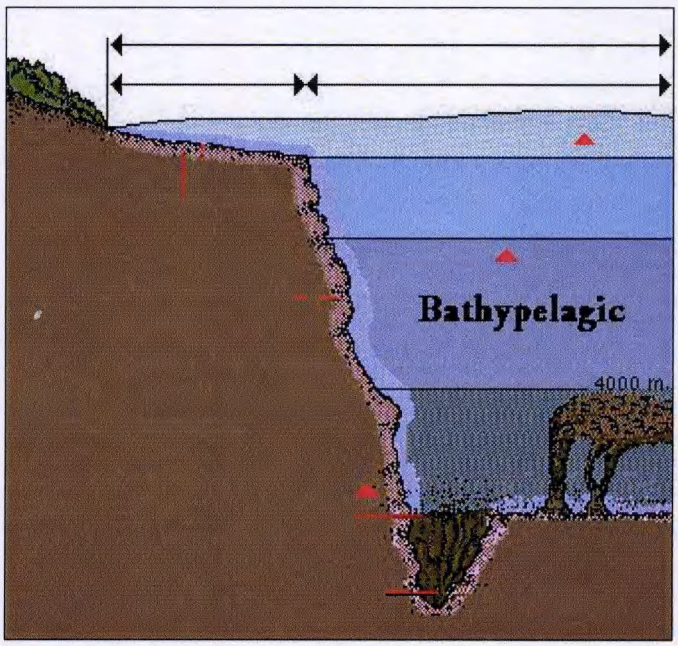


Figure 105. Schematic view of the bathypelagic zone

M. Commensal

To habitat list

This characteristic refers to the fact of commensalism. This means that two organisms of different species live together and share food resources, one species benefiting from the association and the other not being harmed.

N. Crab-holes

To habitat list

Crab-holes are the holes in the sand or another substrate made by living crabs. Some species of Mysidacea prefer to live in this environment.

Figure 106. Example of a beach surface with Crab-holes

O. Rocks

To habitat list

This characteristic refers to the sediment-type. Sediments are generally characterised on grain-size, in this case the size of the different constituents. Rocks are sediments with a grain-size bigger than 64 mm. Data from Buchanan (1971).

P. Gravel

To habitat list

This characteristic refers to the sediment-type. Sediments are generally characterised on grain-size. Gravel is a sediment-type with a grain-size bigger than 4 mm and smaller than 64 mm. This sediment-type is also called pebble. Data from Buchanan (1971).

Q. Sand

To habitat list

This characteristic refers to the sediment-type. Sediments are generally characterised on grain-size. Sand is a sediment-type with a grain-size bigger than 0.0625 mm and smaller than 1 mm. Data from Buchanan (1971).

R. Mud

To habitat list

This characteristic refers to the sediment-type. Sediments are generally characterised on grain-size. Mud is a sediment-type with a grain-size bigger than 0.002 mm and smaller than 0.0039 mm. This sediment type is also called silt. Data from Buchanan (1971).

S. Clay

To habitat list

This characteristic refers to the sediment-type. Sediments are generally characterised on grain-size. Clay is a sediment-type with a grain-size bigger than 0.00006 mm and smaller than 0.002 mm. Data from Buchanan (1971).

T. Reefs

To habitat list

These are ridges or hummocks formed in shallow ocean areas by the calcareous skeletons of certain coelenterates, of which coral polyps are the most important. A coral reef may grow into a permanent coral island.

U. Weeds

To habitat list

This term generally refers to a habitat with a dominant presence of big algae.

8. MORPHOLOGY

The morphology of Mysidacea corresponds with the general morphology of Crustacea. The body consists of three parts: the caput (head), the thorax and the abdomen (**Figure 107**). These three regions have appendages with a characteristic morphology, which is used in classification.

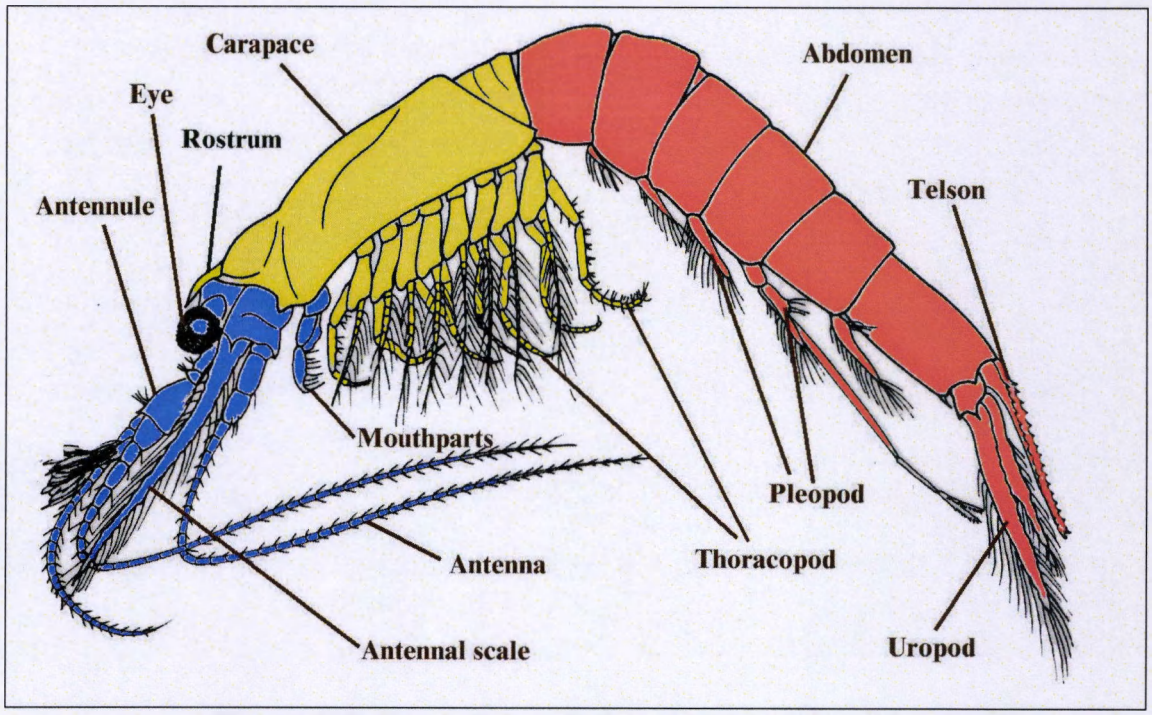


Figure 108. General morphology in lateral view of a mysid

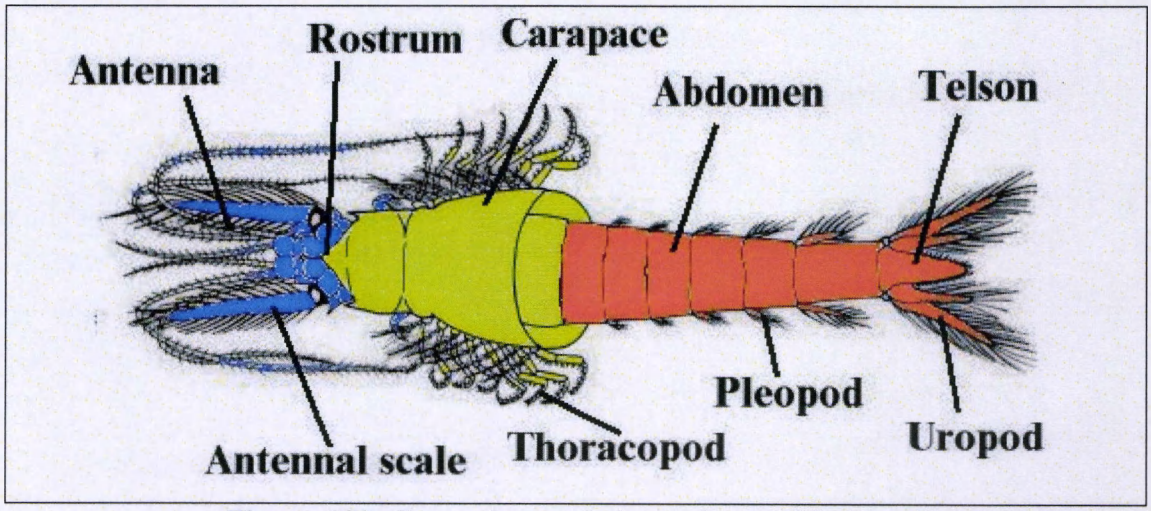


Figure 109. General morphology of a mysid: dorsal view

8.1 Detailed Morphology

In this part morphology of the Mysidacea, as far as needed for using Mysidlan, will be described. More particularly, all the character states, which can be attached to certain morphological descriptors, will be explained, both in words and with an illustration.

Morphology:	Head:	Mouth parts Antennal scale Eyes
	Thorax:	Carapace Thoracopods Marsupium
	Abdomen:	Pleopods Uropods Telson

Table 36. List of links to morphological information

8.2 Morphometry

Apart from the descriptions of morphological states, the database allows entry of morphometric data. In most cases these are characteristic for the species only in combination with other features.

- Total length of males and females
- Standard length of males and females
- Carapace length

8.2.1 Total length

The total length of the animal is one of the most used morphometric characteristics within mysids. Unfortunately, there are a number of ways in which this measurement is taken, and the literature sources consulted do not always state what method was used.. As a result of this, measurements given in the database should be taken as indicative of the real length, rather than as an accurate measurement.
The most widespread way of measuring body length in the recent literature is illustrated in Figure 110: from the most proximal point of the rostrum up to the most distal point of the telson.

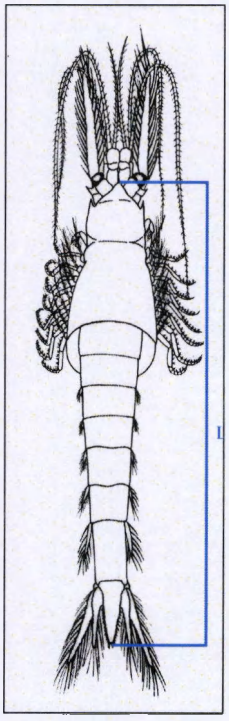


Figure 110. Body length measurement within mysids (L= length)

8.2.2 Standard length

Next to the total body length, the so-called 'standard length' is in use as a measure of overall length; as illustrated in Figure 111, it is measured from the point in between the eyes up to the posterior margin of the last somite. The advantage of the standard length over the total length is that it excludes some intraspecific morphometric variation: the size of the rostrum and the telson can vary a lot within a species. In the standard length these two appendages are not taken in the measurement. Sometimes the standard length is used to calculate the biomass of a specimen.

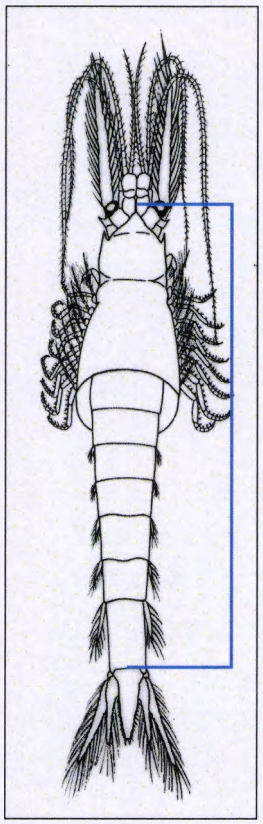


Figure 111. Standard length measurement within mysids

8.2.3 Carapace length

Next to the body length, also the length of the carapace can be a useful tool to identify or classify groups of species. The length of the carapace is measured between the most proximal point of the rostrum and the most distal part of the carapace. It is very important with carapaces with an emarginated posterior to include in the measurement also the lateral parts which cover some more distally located parts than posterior margin of the dorsal part. More general information is included in the figure.

Figure 112. Measurement of the carapace in mysids

8.3 Head

All crustaceans consist of three main body parts: the head (caput), the thorax and the abdomen.
The head wears almost every sense organ. This is projected in a specialised morphology. Typical parts of the head are the eyes, the antennae, the antennules and the different mouth parts.
In Mysidlan only the useful characteristics in terms of determination of species are included.

- Eyes
- Antennal scale
- Mouth parts

Example of the head Tab in Mysidlan on page 78.

8.3.1 Eyes

8.3.1.1 General

Eye morphology does not vary very much within the Mysidacea. Nevertheless in some species the morphological characteristics of the eyes are the identification characteristics. The differences between the different shapes of the cornea are often debatable.

8.3.1.2 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Extremely reduced
Reduced
Well developed (small)
Well developed (big)
Globular
Reniform
Quadrangular
Plate-like
Fused
Two distinct regions
Accessory eye
Special pigmentation
Stalked
Not stalked

Table 37. List of eye shapes

8.3.1.3 Description of shapes

A. Extremely reduced To Shape list

In some species the eyes are extremely reduced. In those cases only a small part of the stalk remains. The reduction of the eyes is mostly an ecological adaptation.

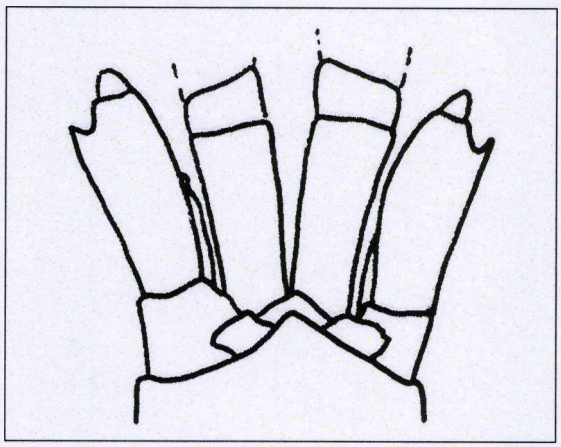


Figure 113. Illustration of extremely reduced eyes

B. Reduced To Shape list

Eyes that are reduced are very small but do still have a small cornea. This reduction is mostly an ecological adaptation. An example is given in Figure 114.

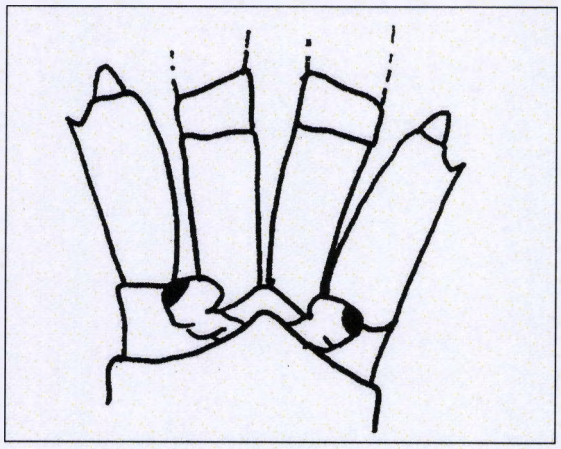


Figure 114. Illustration of reduced eyes

C. Well developed (small)

To Shape list

Small but well developed eyes have a cornea is at least as broad as the stalk. An example is given in Figure 115. The total volume of the eye is relatively small compared to the other appendages of the head.

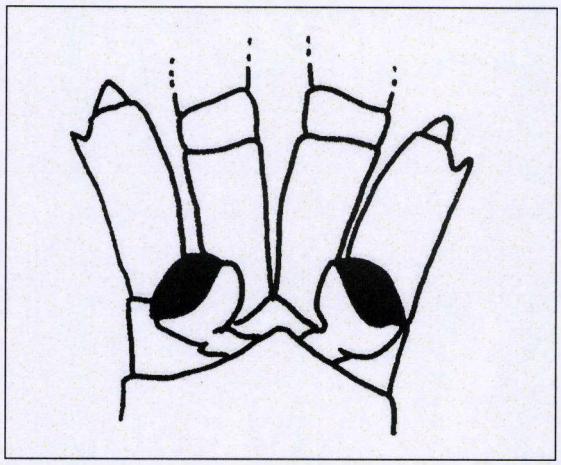


Figure 115. Illustration of small but well developed eyes

D. Well developed (big)

To Shape list

Well-developed eyes have a total volume that is big, compared with the other appendages of the head. An illustration is given in Figure 116.

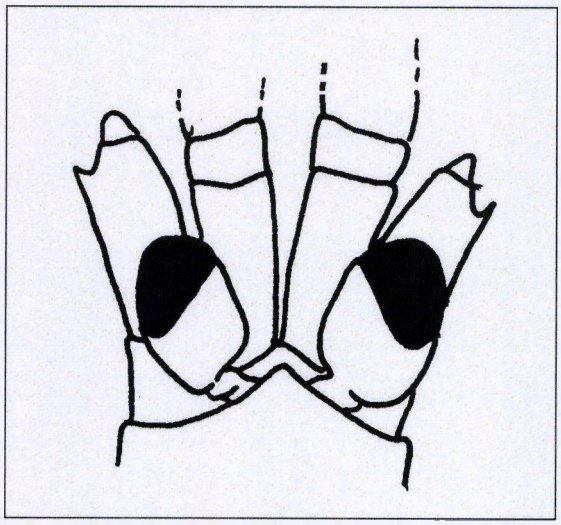


Figure 116. Illustration of big well-developed eyes

E. Globular

To Shape list

Globular eyes have a globular cornea. Some examples are given in Figure 117.

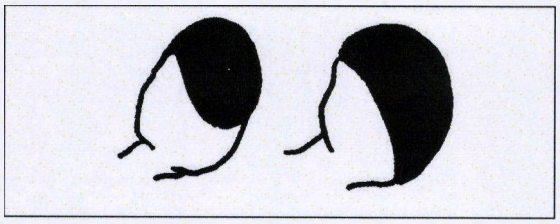


Figure 117. Illustration of globular eyes

F. Reniform

To Shape list

Reniform eyes have a cornea, which has a reniform (kidney-like) shape. The cornea is relatively bean-shaped in dorsal view. An example is given in Figure 118.

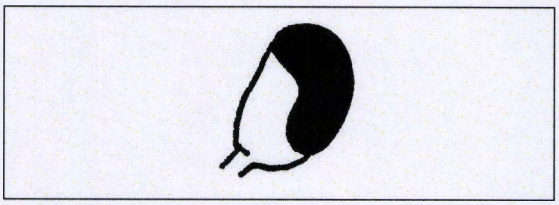


Figure 118. Illustration of a reniform eye

G. Quadrangular

To Shape list

Quadrangular eyes have a cornea, which has a quadrangular-like shape in dorsal view. An example is given in Figure 119.

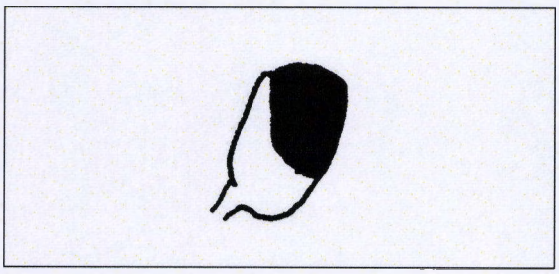


Figure 119. Illustration of a quadrangular eye

H. Plate-like

To Shape list

Plate-like eyes are well-developed eyes which are flattened laterally. In this way the eyes look as plates.

I. Fused

To Shape list

Some species have fused eyes. This means that the right and left stalks are fused such as both the corneas.

J. Two distinct regions

To Shape list

Most species of mysids have left- and right eyes that are well separated ('unfused'). A general illustration is given in Figure 120.

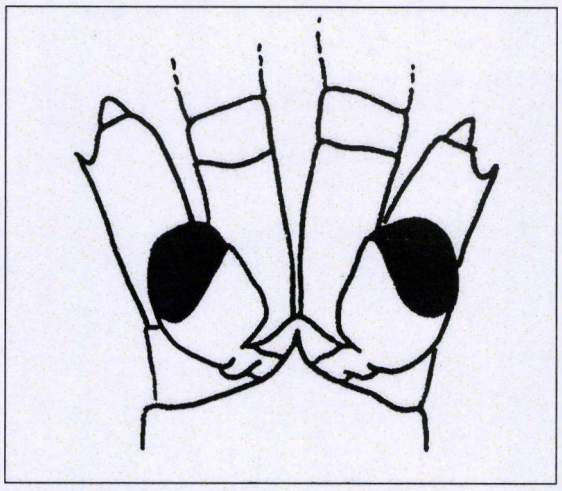


Figure 120. Illustration of unfused eyes

K. Accessory eye

To Shape list

Some species have an additional, accessory cornea surface. Both the corneas can touch each other or be separated. Two examples are given below in Figure 121.

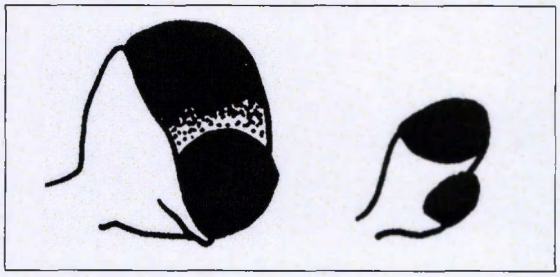


Figure 121. Illustration of accessory eyes

L. Special pigmentation

To Shape list

Some species have eyes, with a special coloured cornea. It has to be clear that this colour is natural and not caused by the medium in which the specimen is stored. Some possible colours are: brown, golf, red …

M. Stalked

To Shape list

Most species of the Mysidacea have stalked eyes. This means that the cornea of the eye does not articulate immediately with the remaining parts of the head. Beneath the cornea there is mostly another structure, a so-called stalk, which produces the eye proximally. Two examples are given in Figure 122.

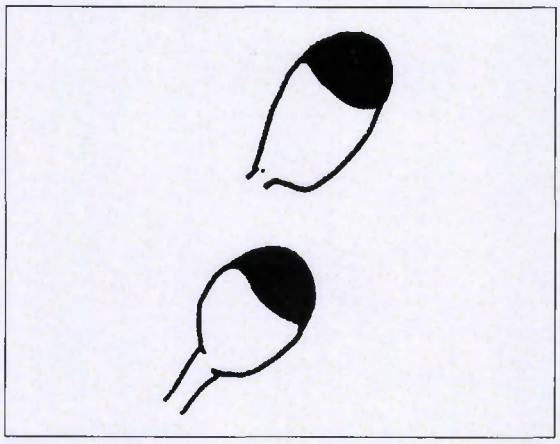


Figure 122. Illustration of stalked eyes

N. Not stalked

To Shape list

In some exceptional cases the eyes are not stalked but articulated with the head. Two illustrations are given in Figure 123.

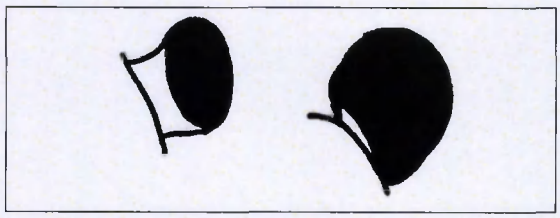


Figure 123. Illustration of unstalked eyes

8.3.2 Antennal scale

8.3.2.1 General

The antennal scale of mysids and also of other crustaceans is a part of the antenna. The antenna is just like any other appendage build with three parts: a sympod, an exopod and an endopod. The exopod and endopod in Mysids are modified into the antennal scale and a flagellum (see Figure 124).
The flagellum does not have a big determining power. The antennal scale is very important and easy to see for determination.
The scale is generally in the form of a flat plate aligned or not with setae.
In the following part the most regular found shape-characteristics of the antennal scale will be discussed more in detail.

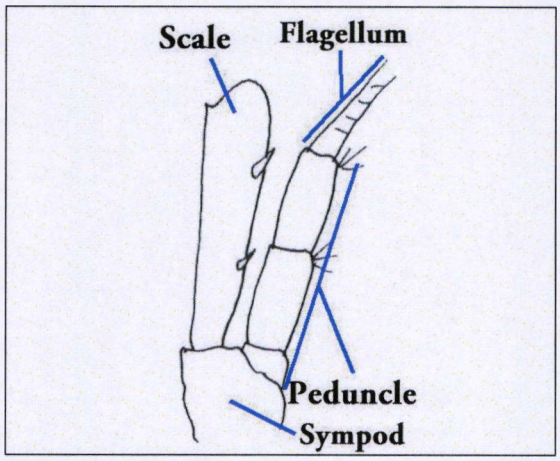


Figure 124. Illustration of the general form of the antenna

8.3.2.2 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Absent
Long and narrow
Oval
Rectangular
Distal end rounded
Distal end pointed
Distal end flat
Distal spine
No distal spine
Shorter than peduncle
Longer than peduncle
Same size as peduncle
Setation all around
Inner margin naked
Outer margin naked
No setation
One segment
Two segments

Table 38. List of Antennal scale shapes

8.3.2.3 Description of shapes

A. Absent To Shape list

In some species the antennal scale is extremely reduced or even absent. These cases are exceptions and do not occur in a lot of genera. There are two genera that have species with absent or reduced antennal scales: Arachnomysis and Caesaromysis. The scales are sometimes replaced by a long spine (as shown in Figure 125).

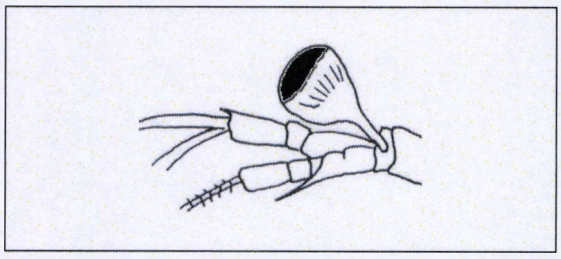


Figure 125. Illustration of a reduced antennal scale

B. long and narrow

To Shape list

Some mysids have an antennal scale, which is very long and narrow shaped. In those cases the scale is much longer than the peduncle.

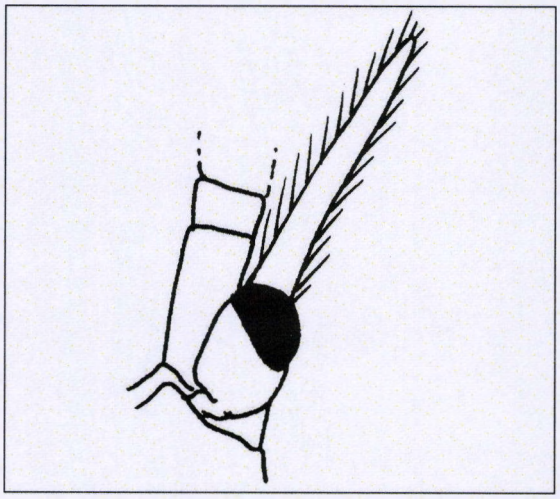


Figure 126. Illustration of long and narrow antennal scale

C. Oval

To Shape list

In a lot of mysids the antennal scale has an oval shape. It can be longer or shorter than the peduncle or wear spines. The general shape of an oval scale is shown in Figure 127.

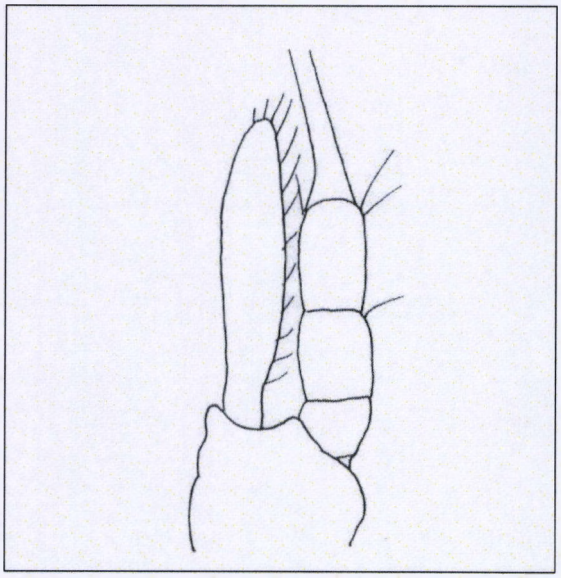


Figure 127. Illustration of scale with an oval shape

D. Rectangular

To Shape list

Some mysids have a scale, which looks in general rectangular. This means that the breadth is on every place of the scale equal. Next to that the scale has a flat end. An idealised shape is shown in Figure 128.

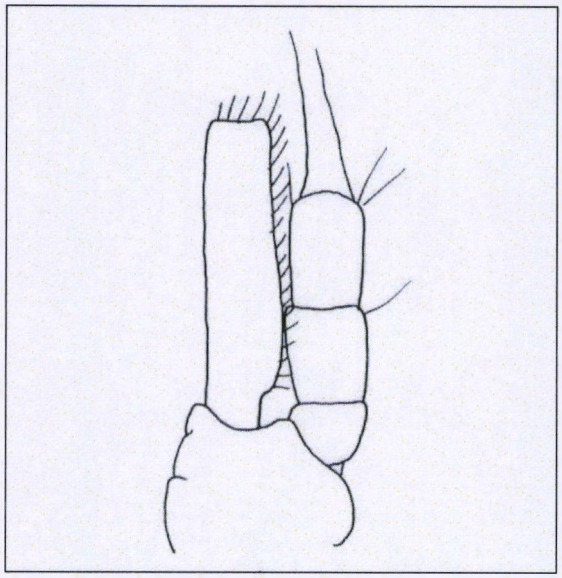


Figure 128. Illustration of a scale with a rectangular shape

E. Distal end rounded

To Shape list

In lots of species the antennal scale has a rounded end. This means that the inner and outer lateral margin converge in curve-like way. This illustrated in Figure 129.

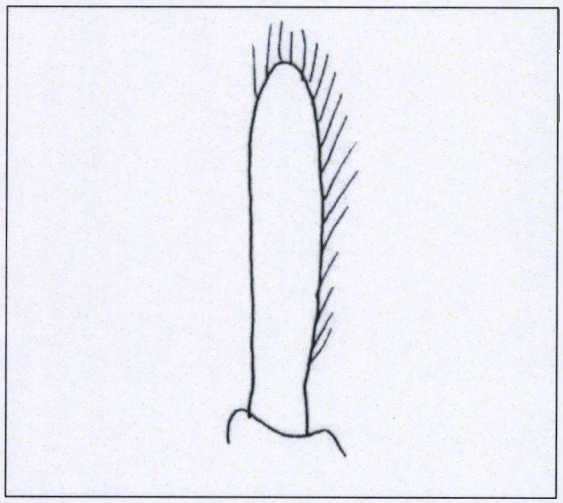


Figure 129. Illustration of scale with a distal rounded end

F. Distal end pointed

To Shape list

The distal end of the antennal scale can be pointed. This is shown in Figure 130. In general this means that the lateral margins converge to each other reaching each other in one most distal point.

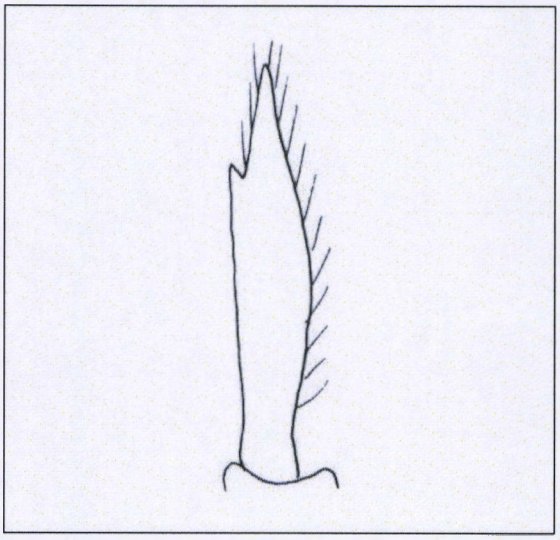


Figure 130. Illustration of a scale with appointed end

G. Distal end flat

To Shape list

The distal of the antennal scale can be flat. This means that the lateral margins do not converge or diverge. There is a distal margin, which is flat and goes from one lateral margin to another. This is shown in Figure 131.

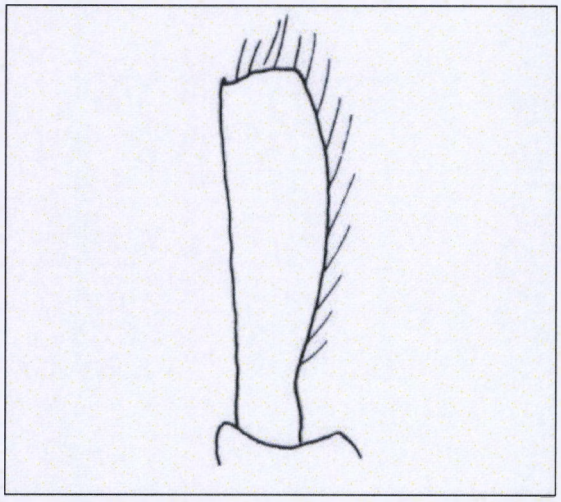


Figure 131. Illustration of a scale with a flat distal end

H. Distal spine

To Shape list

In some species the antennal scale wears a distal spine. This spine is generally located distally on the outer margin. This is shown in Figure 132.

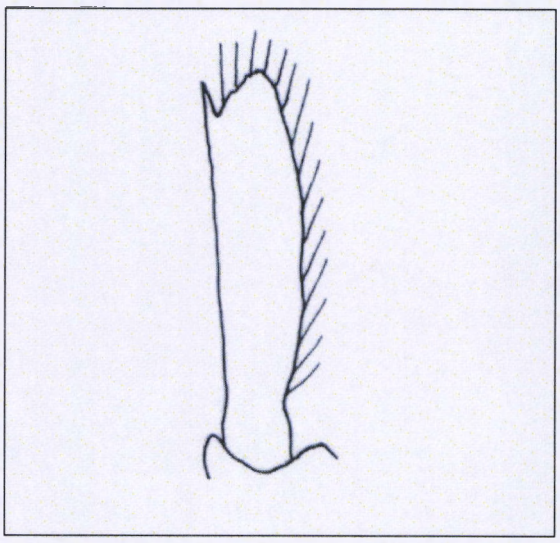


Figure 132. Illustration of a scale with a distal spine

I. No distal spine

To Shape list

Some species do not wear a distal spine. This means that distally the lateral margins do not form an extra appendage upon the scale, which is generally in the shape of a spine. This is illustrated in Figure 133.

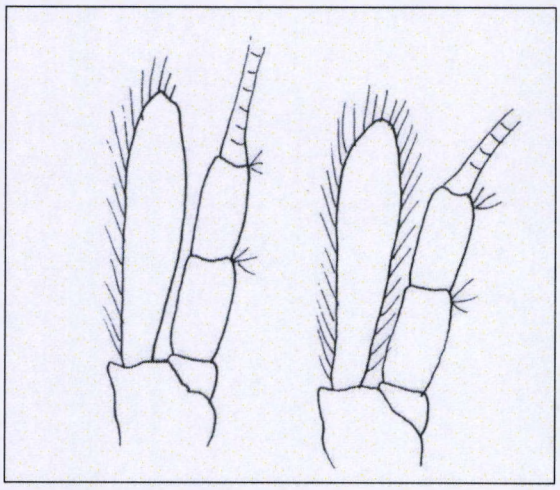


Figure 133. Illustration of antennal scale without distal spine

J. Shorter than peduncle

To Shape list

The morphologic term defines the length of the scale referring to the peduncle. The scale is in this case shorter than the peduncle (first three segments of the endopod). This is shown in Figure 134.

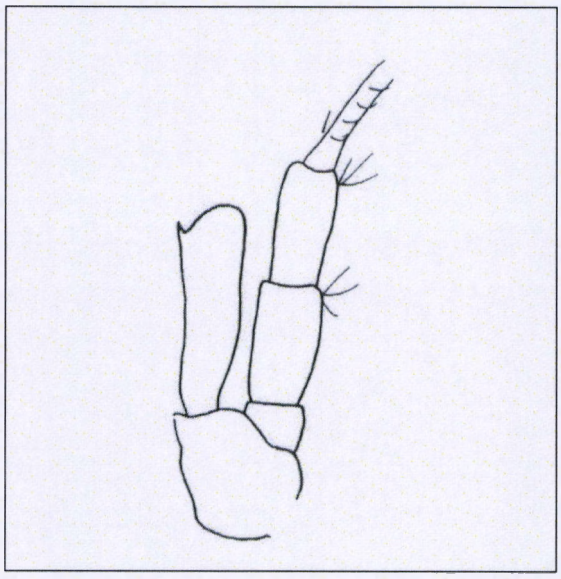


Figure 134. Illustration of a scale which is shorter than the peduncle

K. Longer than peduncle

To Shape list

The morphologic term defines the length of the scale referring to the peduncle. The scale is in this case longer than the **peduncle** (first three segments of the endopod). This is shown in Figure 135.

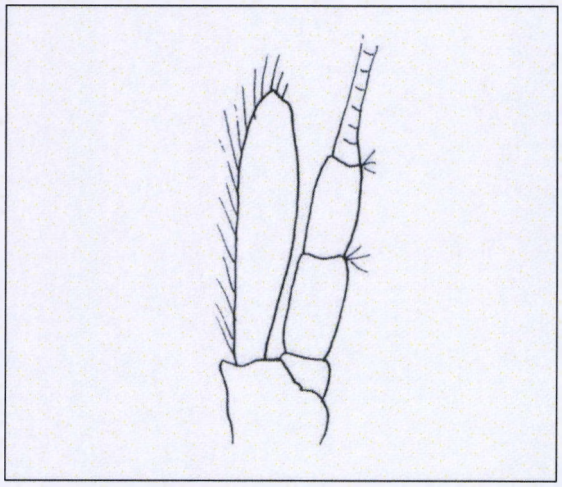


Figure 135. Illustration of a scale which is longer than the peduncle

L. Same size as peduncle

To Shape list

The morphologic term defines the length of the scale referring to the peduncle. The scale is in this case as long as the **peduncle** (first three segments of the endopod). This is shown in Figure 136.

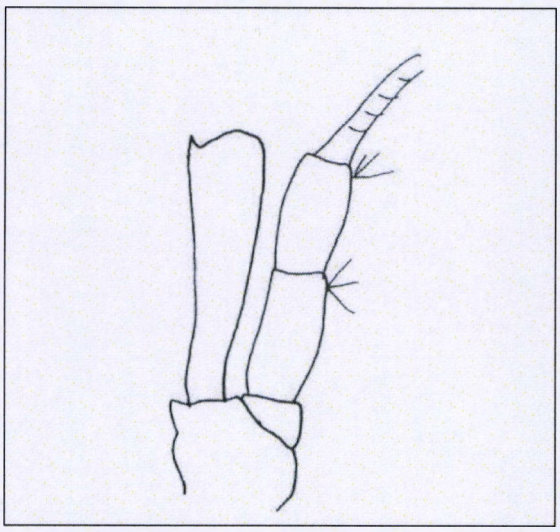


Figure 136. Illustration of scale which is as log as the peduncle

M. Setation all around

To Shape list

Most of the antennal scales wear appendages such as setae or spines. The setation can be located on the scale in different ways. In this case the setation is located on the lateral margins all around the scale. This is shown in Figure 137.

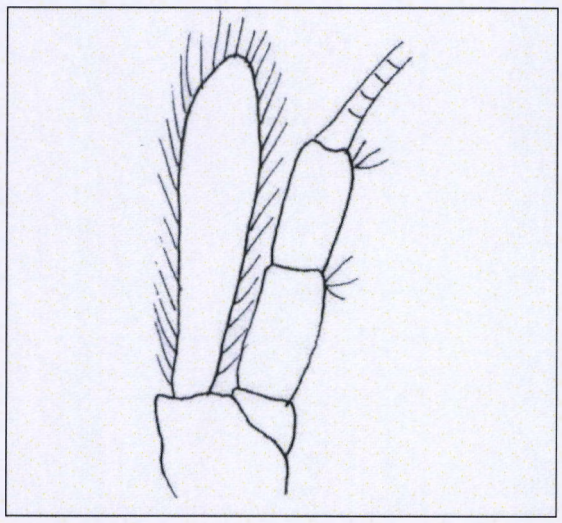


Figure 137. Illustration of a scale with setation all around

N. Inner margin naked

To Shape list

Most of the antennal scales wear appendages such as setae or spines. The setation can be located on the scale in different ways. In this case the setation is located on the lateral margin at the outer side of the scale. This is the side most away from the peduncle or the middle line of the animal. This is shown in Figure 138.

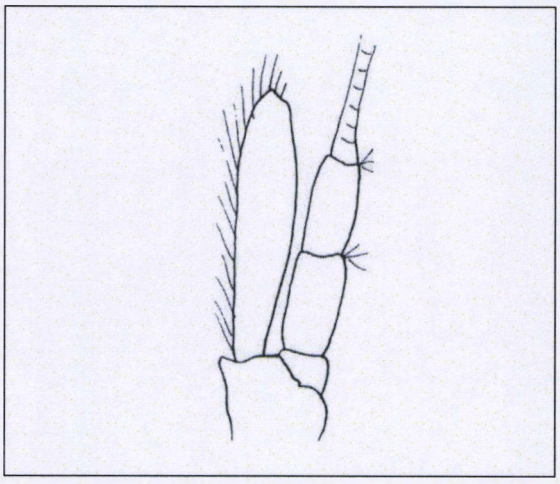


Figure 138. Illustration of a scale with a naked inner margin

O. Outer margin naked

To Shape list

Most of the antennal scales wear appendages such as setae or spines. The setation can be located on the scale in different ways. In this case the setation is located on the lateral margin on the inner side of the scale. This is the side closest to the peduncle or the middle line of the animal. This is shown in Figure 139.

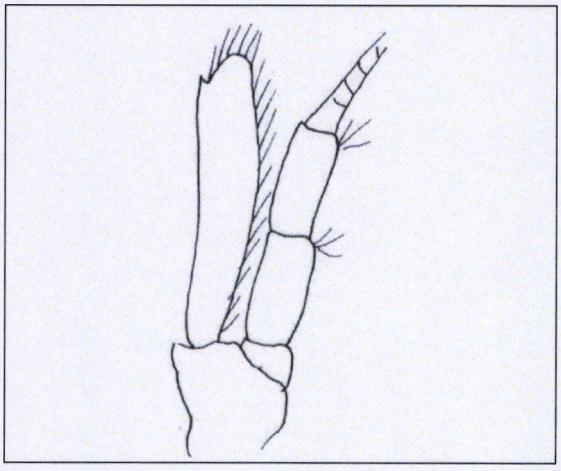


Figure 139. Illustration of a scale with a naked outer margin

P. No setation

To Shape list

In some cases there is no setation at all on the antennal scale. Both the inner and outer margin are naked. Next to this the scale can wear other appendages such as spines. An illustration of a naked antennal scale is given in Figure 140.

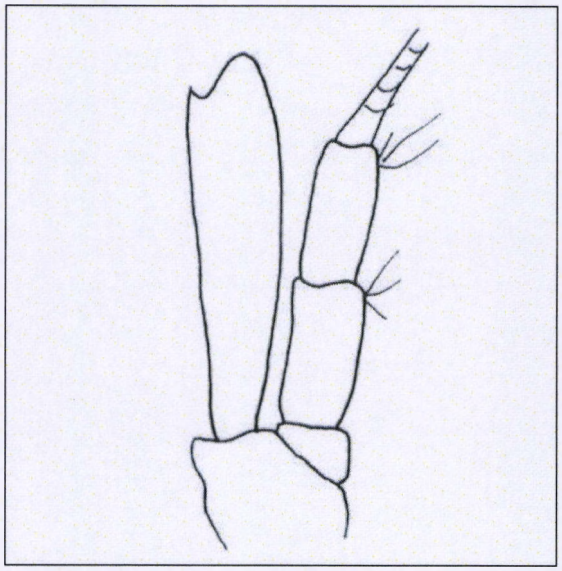


Figure 140. Illustration of scale with naked margins

Q. One segment

To Shape list

The antennal scale of mysids can be of one or two segments. In this case the scale consists of one segment which is of course the whole scale. This is shown in Figure 141.

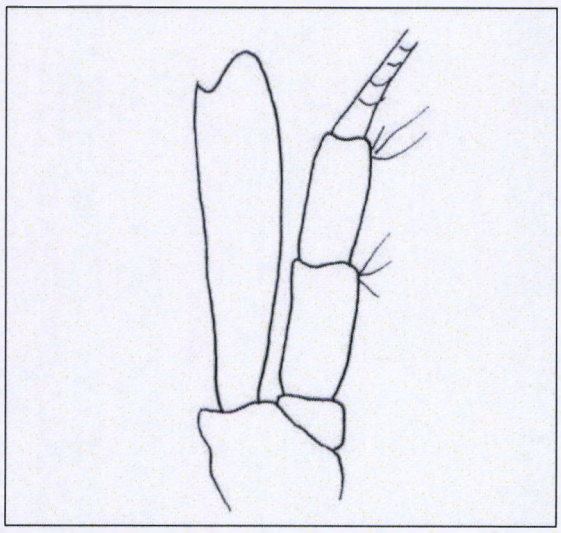


Figure 141. Illustration of scale of one segment

R. Two segments

To Shape list

The antennal scale of mysids can be of one or two segments. In this case the scale consists of two segments. The suture between the two segments is in most cases located distal on the scale. This is shown in Figure 142.

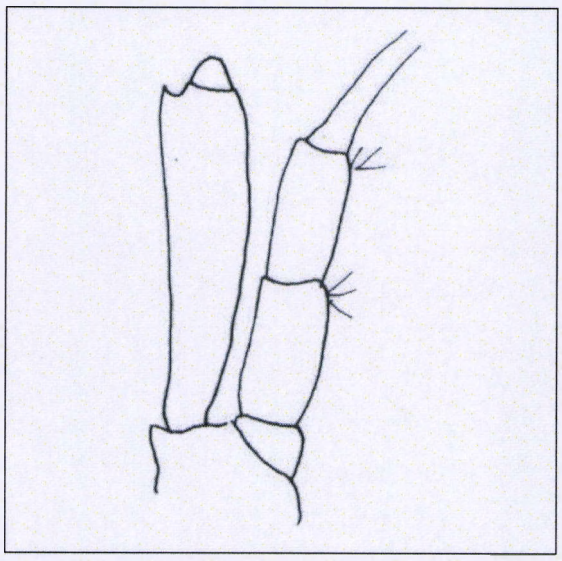


Figure 142. Illustration of scale of two segments

8.3.3 Mouth parts

8.3.3.1 General

On the head different appendages are present. Apart from the sensory appendages, there are some appendages related to feeding which are called the mouth parts.
There are four different mouth parts: the labrum, the mandibles, the maxilles and the maxillules. This does not mean that only these parts are related with the action of feeding. Also thoracic appendages, especially the first pair, play a role in the feeding techniques. In the multiple-choice box in Mysidlan some general morphologic characteristics on some mouth parts are present.
Mouth parts are not generally used for identification, since studying them involves dissection, but are in some cases characteristic for the species. An overview on the mouth parts is given in Figure 143.

Figure 143. EM photo of ventral on the mouth parts (L=labrum, M=Mandibel, P=premaxillare)

8.3.3.2 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Labrum symmetrical
Labrum asymmetrical
Labrum with rostral spine
Distal segment maxilla rectangular
Distal segment maxilla crescent shaped
Distal segment maxilla triangular
Mandibular palp A
Mandibular palp B
Mandibular palp C

Table 39. List of mouth part shapes

8.3.3.3 Description of shapes

8.3.3.3.1 Labrum

The labrum in Mysidacea and also in other crustaceans can be shaped symmetrically or asymmetrically.

A. Labrum symmetrical To Shape list

A symmetrical shape of the labrum means that the middle line of the animal divides it in two equal parts. This is shown in Figure 144.

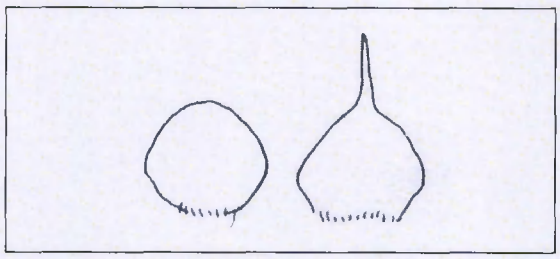


Figure 144. Illustration of symmetrical labrum

B. Labrum asymmetrical To Shape list

A symmetrical shape of the labrum means that the middle line of the animal doesn't divide it two equal parts. This is shown in Figure 145 and also on the photo in Figure 143.

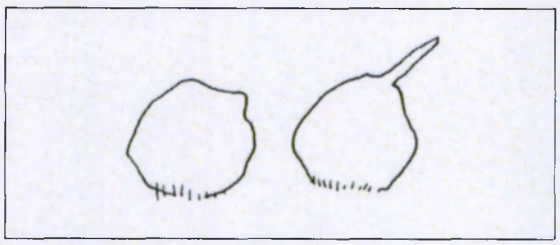


Figure 145. Illustration of asymmetrical labrum

C. Labrum with rostral spine To Shape list

In a lot of species in Mysidacea the labrum wears a spine at the most rostral side. This is illustrated in Figure 146.

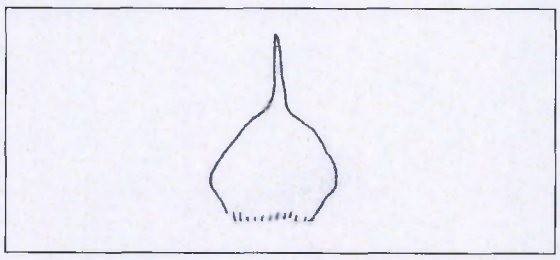


Figure 146. Illustration of a labrum with a rostral spine

8.3.3.3.2 Maxilla

The maxilla consists also of an endopod and an exopod. The most distal segment of the exopod can be of different shapes. The shape is in some cases difficult to define and sometimes subjective decisions have to be made.

A. Distal segment maxilla rectangular To Shape list

The shape of the distal segment of the exopod is rectangular as illustrated in Figure 147. The shape is in some cases difficult to define and sometimes, subjective decisions have to be made.

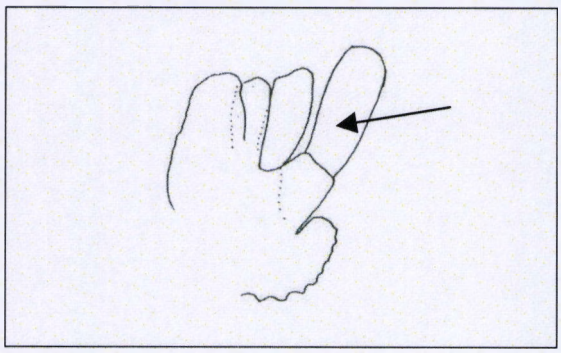


Figure 147. Illustration of a maxilla with a rectangular shaped distal end of the exopod

B. Distal segment maxilla crescent shaped

To Shape list

Crescent shaped refers to a moonlike shape. An example is shown in Figure 148.

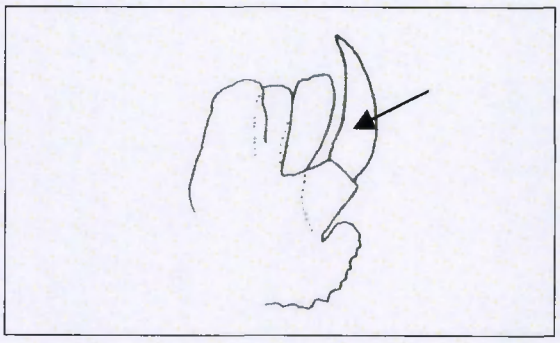


Figure 148. Illustration of a maxilla with a crescent shaped distal end of the exopod

C. Distal segment maxilla triangular

To Shape list

An example of a triangular distal segment is shown in Figure 149.

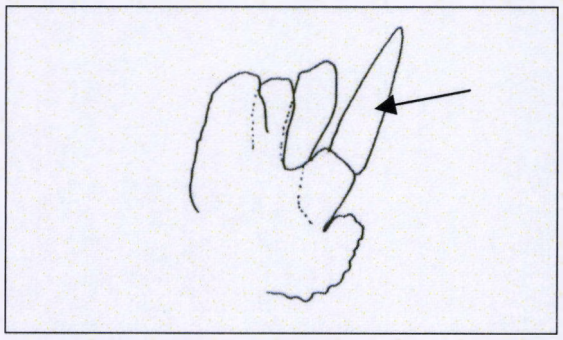


Figure 149. Illustration of a maxilla with a triangular shaped distal end of the exopod

8.4 Thorax

The thorax consists of eight segments (thoracomeres), with one pair of appendages (thoracopods) per segment, and the carapace, which folds around the thoracomeres. In the females the last thoracopods can generate a brood chamber: the marsupium.
Characters can be entered on several parts of the thorax:

- Carapace
- Thoracopod
- Marsupium

Example of the thorax tab in Mysidlan on page 78.

8.4.1 Carapace

8.4.1.1 General

The carapace in Mysidacea is in general well developed. In the majority of species it covers the thorax laterally, but leaves the last one or two thoracic somites exposed in dorsal view when a dorsal emargination is present. The carapace is not attached to more than three of the thoracic somites. It simply envelops the remaining somites. On the carapace towards the proximal end there is a cervical sulcus running across the dorsal surface above the region of the mandibles. The anterior margin of the carapace is usually produced forward in a rostrum, the shape of which is used as a taxonomic character.
The posterior margin can be emarginated or flat. The different shapes are discussed more in detail below.

8.4.1.2 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Posterior margin emarginated
Posterior margin rounded
Posterior margin flat
Lobes
Rostrum absent
Rostrum small
Rostrum well developed
Rostrum acutely pointed
Rostrum bluntly pointed
Rostrum acutely rounded
Rostrum bluntly rounded
Rostrum spear-like

Table 40. List of Carapace shapes

8.4.1.3 Description of shapes

A. Posterior margin emarginated To Shape list

The posterior margin of the carapace bows back proximally extending quite deep. In this way an emargination is formed. This is shown in Figure 150.

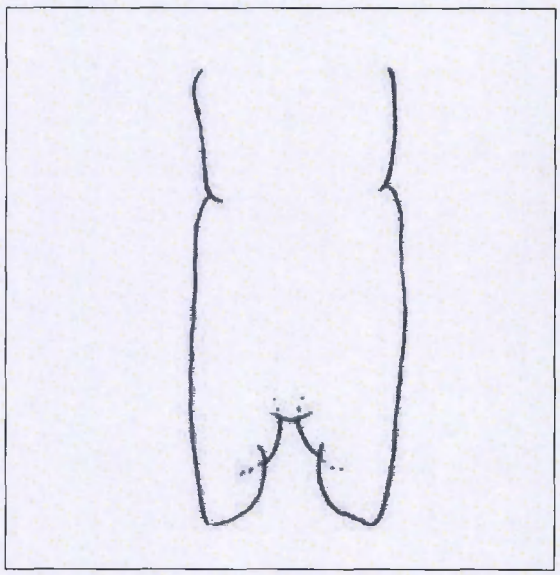


Figure 150. Illustration of carapace with an emarginated posterior margin

B. Posterior margin rounded To Shape list

The posterior margin of the carapace is produced in some kind of a proximal orientated curve. This is shown in Figure 151.

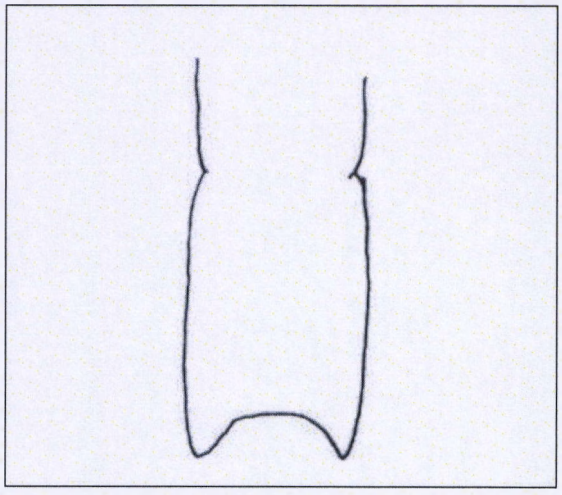


Figure 151. Illustration of a carapace with a rounded posterior margin

C. Posterior margin flat

To Shape list

The posterior margin of the carapace is not produced into an emargination or is not rounded. This is shown in Figure 152.

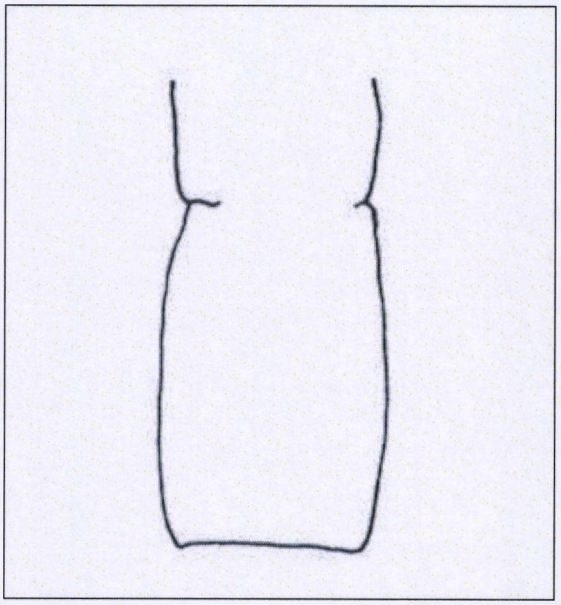


Figure 152. Illustration of carapace with a flat posterior margin

D. Lobes

To Shape list

The lateral margins of the emargination consist of different lobes that overlay each other.

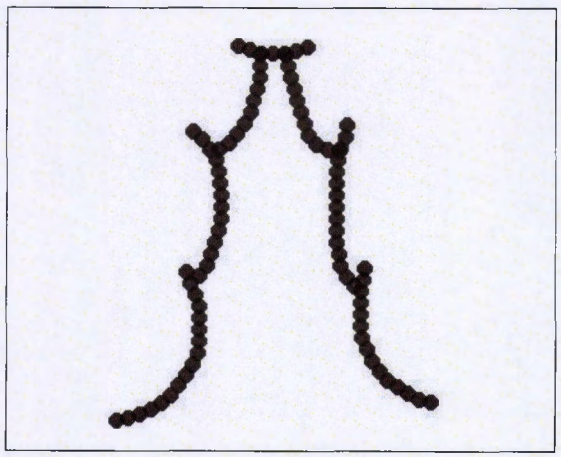


Figure 153. Illustration of an emargination of which the lateral borders are composed of lobes

E. Rostrum absent

To Shape list

Not in all species of mysids a rostrum is present. Sometimes the proximal margin of the carapace is just straight or rounded and produces no extension in between the eyes.

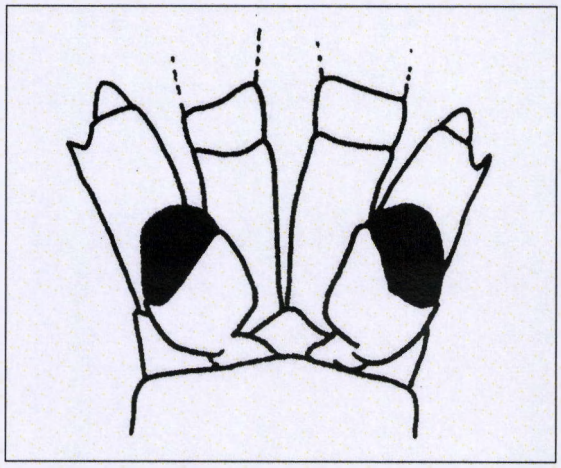


Figure 154. Illustration of a carapace without a rostrum

F. Rostrum small

To Shape list

A rostrum is small when the proximal margin just produces a very small extension, which goes little in between the eyes. This is illustrated in a generalised way in Figure 155.

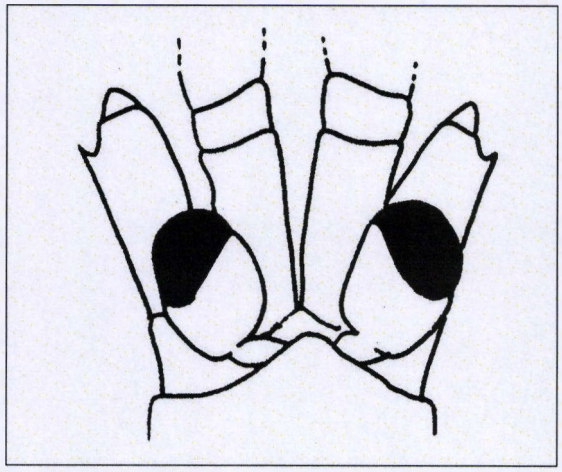


Figure 155. Illustration of a small rostrum

G. Rostrum well developed

To Shape list

The rostrum can be well developed. This is the case in most species of mysids. This means that the proximal margin of the carapace extends clearly in between the eyes. This illustrated in Figure 156.

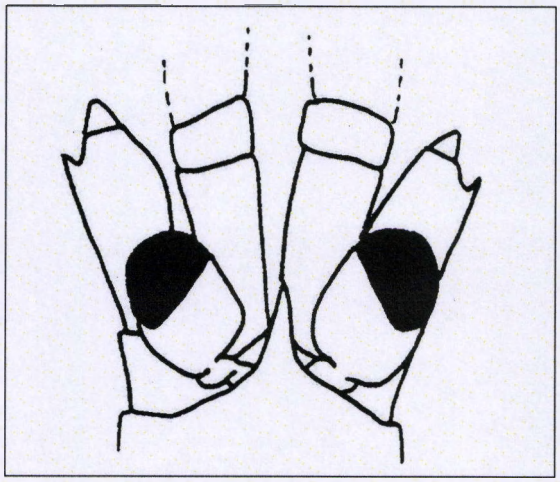


Figure 156. Illustrations of a well-developed rostrum

H. Rostrum acutely pointed

To Shape list

The rostrum can be acutely pointed. This means that the lateral margins converge and meet in a single point. This is shown in Figure 157.

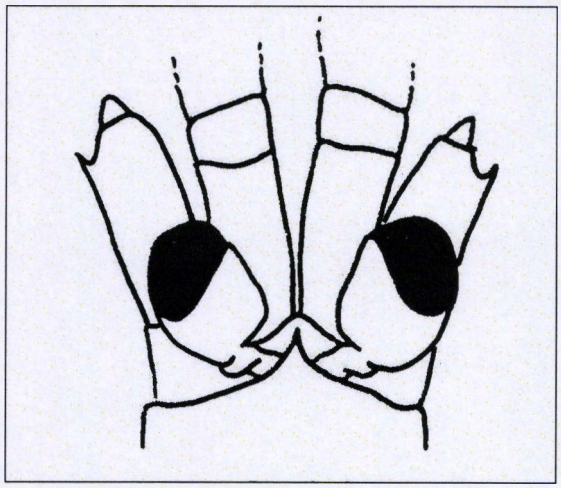


Figure 157. Illustration of an acutely pointed rostrum

I. Rostrum bluntly pointed

To Shape list

A rostrum can be bluntly pointed. This term refers to the fact that the rostrum looks pointed and so the lateral margins converge but they do not meet in one point. The most proximal part is produced in a curved way. This is illustrated in Figure 158.

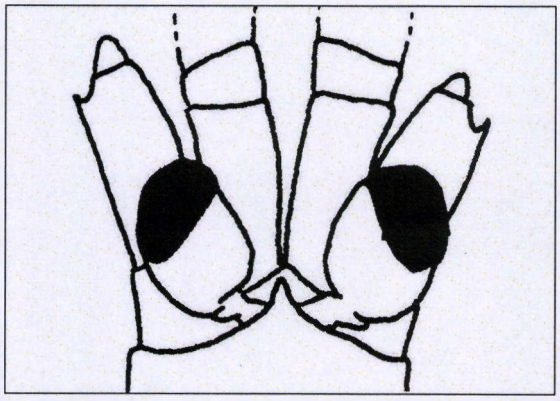


Figure 158. Illustration of a bluntly pointed rostrum

J. Rostrum acutely rounded

To Shape list

The rostrum can be acutely rounded. This means that the rostrum extends in between the eyes and the margins produce a curved contour. This is different from bluntly pointed because in that case the rostrum extends further in between the eyes and looks more pointed. This shape of rostrum is illustrated in Figure 159.

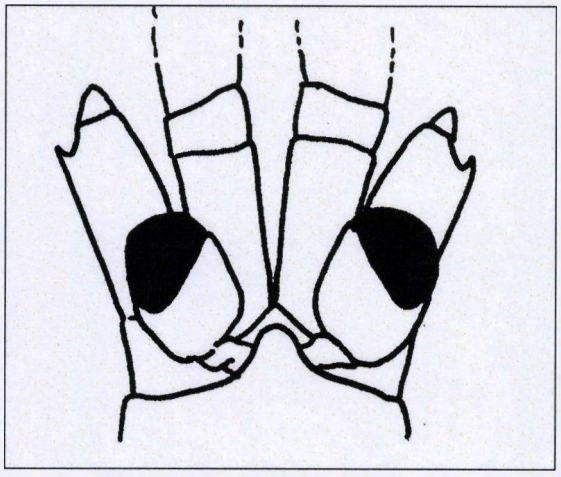


Figure 159. Illustration of an acutely rounded rostrum

J. Rostrum bluntly rounded

To Shape list

The rostrum can be bluntly rounded. This means that the rostrum does not extend in between the eyes and the margins produce a curved contour. This is different from bluntly pointed because in that case the rostrum extends further in between the eyes and looks more pointed. This shape of rostrum is illustrated in Figure 160.

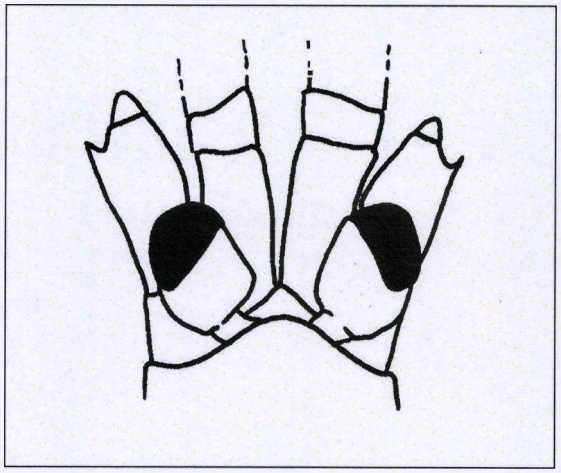


Figure 160. Illustration of a bluntly rounded rostrum

K. Rostrum spear-like

To Shape list

The rostrum can be spear-like. This means that the rostrum is acutely pointed and is extending far before the most proximal edge of the eyes. On Figure 161 this is illustrated in a general way.

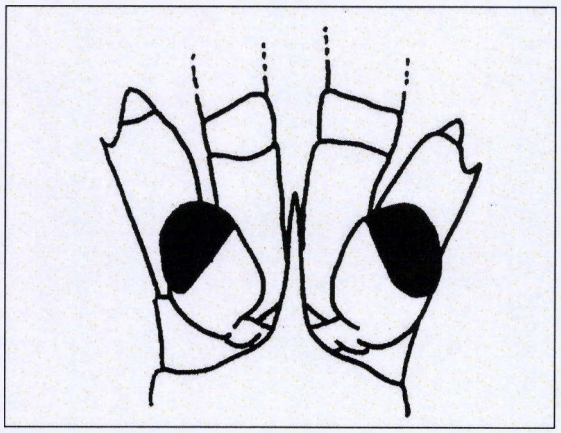


Figure 161. Illustration of a spear-like rostrum

8.4.2 Thoracopods

8.4.2.1 General

The thoracopods are the appendages on the thoracal somites. There are eight thoracic somites with on each of these a pair of thoracopods.
Each of the thoracopods consists of a sympod, an exopod and an endopod. These different parts have for each pair of thoracic limbs their own characteristics. The thoracopods are not the most important parts of the body in terms of classification. Nevertheless some characteristics are given in Mysidlan, so they can be valuable for determination or for comparing different groups of species.

8.4.2.2 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained in more detail in the next part.

Shapes
<NA>
2-8 similar
3 elongated in the male
4 elongated in the male
5 elongated in the male
6 elongated in the male
7 elongated in the male
8 elongated in the male
Exopod 2-8 > 5 segments
Exopod 2-8 > 8 segments
Exopod 2-8 > 10 segments
Exopod 2-8 > 15 segments
Exopod first segment with hook
Exopod first segment no hook
Armed with spines
Armed with setae
Armed with plumose setae
Special shape (rem.)

Table 41. List of thoracopod shapes

8.4.2.3 Description of shapes

A. 2-8 similar To Shape list

This term refers to the fact that the second to the eighth thoracopod look the same. This means that there are no extreme special limbs in the series. There may be some variation in the number of segments of the endopods and the exopods. The first limb is not taken into account here, because it is always modified and is used while feeding.

B. 3 elongated To Shape list

This term refers to the fact that the third pair of thoracopods is elongated compared with the other thoracopods. It is possible that next to this pair also one or more other pairs are elongated.

C. 4 elongated To Shape list

This term refers to the fact that the fourth pair of thoracopods is elongated compared with the other thoracopods. It is possible that next to this pair also one or more other pairs are elongated.

D. 5 elongated To Shape list

This term refers to the fact that the fifth pair of thoracopods is elongated compared with the other thoracopods. It is possible that next to this pair also one or more other pairs are elongated.

E. 6 elongated To Shape list

This term refers to the fact that the sixth pair of thoracopods is elongated compared with the other thoracopods. It is possible that next to this pair also one or more other pairs are elongated.

F. 7 elongated To Shape list

This term refers to the fact that the seventh pair of thoracopods is elongated compared with the other thoracopods. It is possible that next to this pair also one or more other pairs are elongated.

G. 8 elongated To Shape list

This term refers to the fact that the eight pair of thoracopods is elongated compared with the other thoracopods. It is possible that next to this pair also one or more other pairs are elongated.

H. Exopod 2-8 > 5 segments

To Shape list

This term refers to the fact that the exopods of the second to the eight thoracopods have more than five segments and less than nine segments.

I. Exopod 2-8 > 8 segments

To Shape list

This term refers to the fact that the exopods of the second to the eight thoracopods have more than eight segments and less than eleven segments.

J. Exopod 2-8 > 10 segments

To Shape list

This term refers to the fact that the exopods of the second to the eight thoracopods have more than ten segments and less than sixteen segments.
An example of this case is given in the figure below.

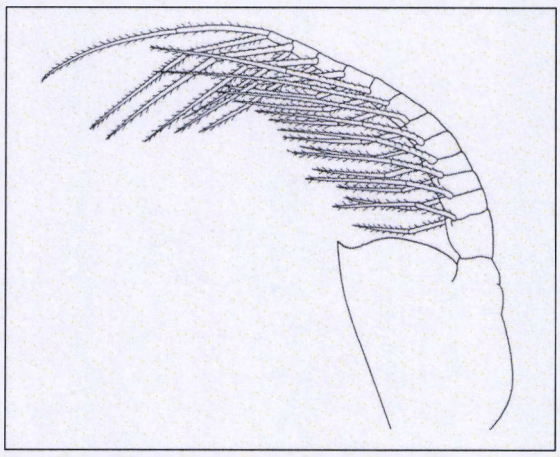


Figure 162. Illustration of an exopod with more than 10 segments and less than 16.

K. Exopod 2-8 > 15 segments

To Shape list

This term refers to the fact that the exopods of the second to the eight thoracopods have more than fifteen segments.

L. Exopod first segment with hook

To Shape list

In some cases the first segment of the exopod wears a distal hook. In most cases, this first segment is expanded.

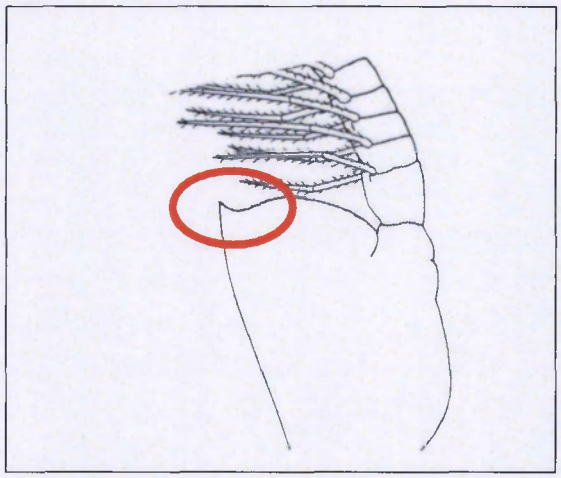


Figure 163. Illustration of an exopod with the first segment with a hook

M. Exopod first segment no hook

To Shape list

In some cases the first segment of the exopod is distally rounded and doesn't wear any appendages. In most cases, this first segment is expanded.

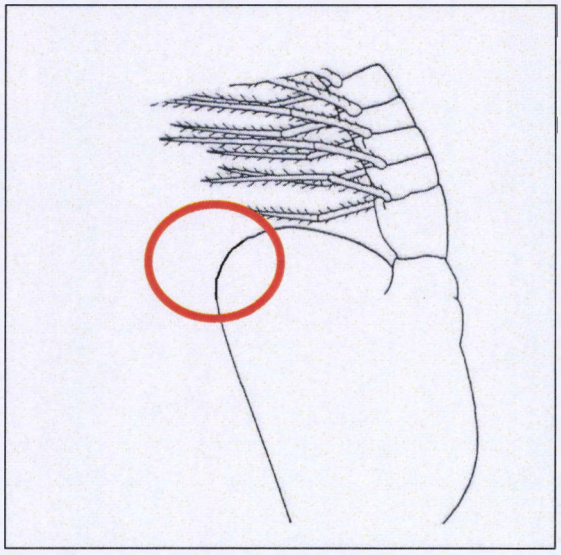


Figure 164. Illustration of an exopod with a first segment without a hook

N. Armed with spines

To Shape list

The segments of sympods, endopods and exopods can be armed with spines. These spines can be inserted anywhere on the thoracopods. An illustration is given in Figure 165.

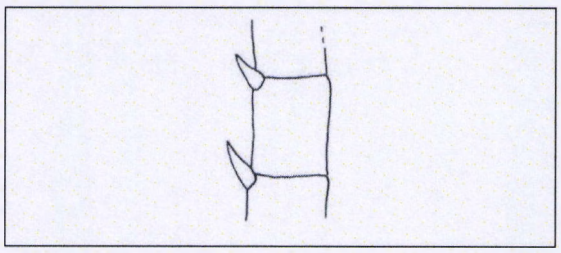


Figure 165. Illustration of a segment armed with spines

O. Armed with setae

To Shape list

The segments of sympods, endopods and exopods can be armed with setae. These can be inserted anywhere on the thoracopods. An illustration is given in Figure 166.

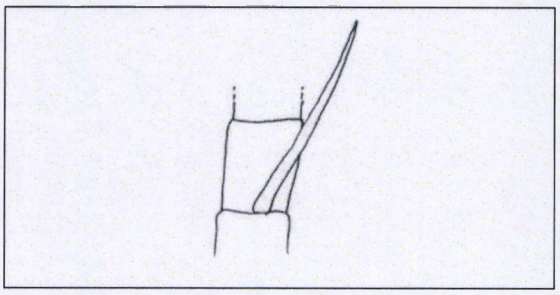


Figure 166. Illustration of a segment armed with a seta

P. Armed with plumose setae

To Shape list

The segments of sympods, endopods and exopods can be armed with plumose setae (setae with setules upon it). These can be inserted anywhere on the thoracopods. An illustration is given in Figure 167.

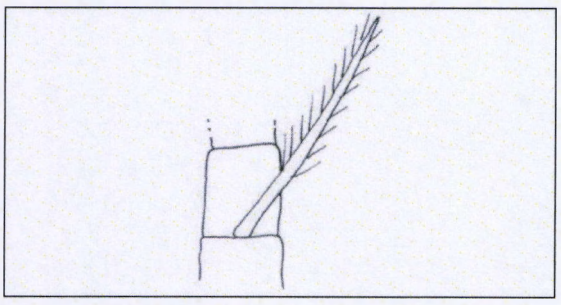


Figure 167. Illustration of segment armed with a plumose seta

Q. Special shape (rem.) To Shape list

This option is added to include also special features typical for a species. This feature can be described more profoundly in the "remarks" tab.

8.4.3 Marsupium

8.4.3.1 General

The presence of the marsupium is a one of the typical characteristic, which define the order of the Mysidacea. It only occurs in females. The feature is used as brood chamber. It is composed of a variable number of lamellae. These lamellae are deformed endopods of the eight thoracopod or deformed pieces of the body wall of the abdomen

8.4.3.2 List of shapes

A list of shapes present in Mysidlan is given below.

Shapes
<NA>
2 pairs of lamellae
3 pairs of lamellae
7 pairs of lamellae

Table 42. List of marsupium shapes

8.5 Abdomen

The abdomen in Mysidacea consists of six segments. All these segments wear their typical extremities. The first five segments wear the uni- or biramous pleopods, while the last segment wears the uropods and the telson. The uropods can be different in males and females.
In Mysidlan characteristics can be entered on different parts of the abdomen:

- Pleopods
- Uropods
- Telson

Example of first tab on the abdomen in Mysidlan on page 79.
Example of second tab on the abdomen in Mysidlan on page 79.

8.5.1 Pleopods

8.5.1.1 General

The pleopods are the extremities of the abdominal segments. There is a pair of them on each of the first five abdominal segments. They are in most species sexually dimorph. This is because of the function of the pleopods. They play a big role in the sexual behaviour. The morphology of the pleopods is in a lot of species and genera more in general a determining factor. The morphology of each of the five pairs can be closely the same or in other species completely different. That's the reason why each of the pleopods has some fields in the database to describe its basic morphology.
These fields are: rami, number of segments of the endopod and the exopod and special features.
Example of the pleopods Tab Mysidlan

8.5.1.2 Rami

The pleopods are build up out of two or three main parts depending on their rami. In each pleopod, there is a sympod, which consist mostly of two segments: a small coxa and a large basis. Then normally there is an endopod and an exopod. In some cases one of these last ones mostly the endopod reduces and the pleopod is mainly formed by the exopod. This is a so-called uniramous pleopod. When both the endopod and the exopod are present then they talk about a biramous pleopod. This is illustrated in Figure 168& Figure 169.

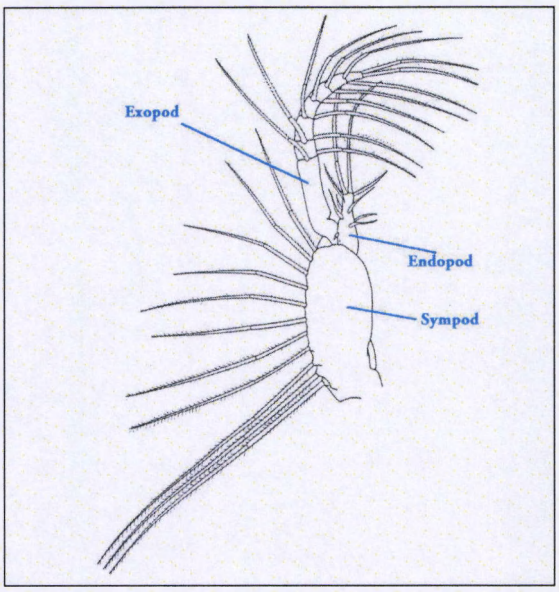


Figure 168. Illustration of a biramous pleopod

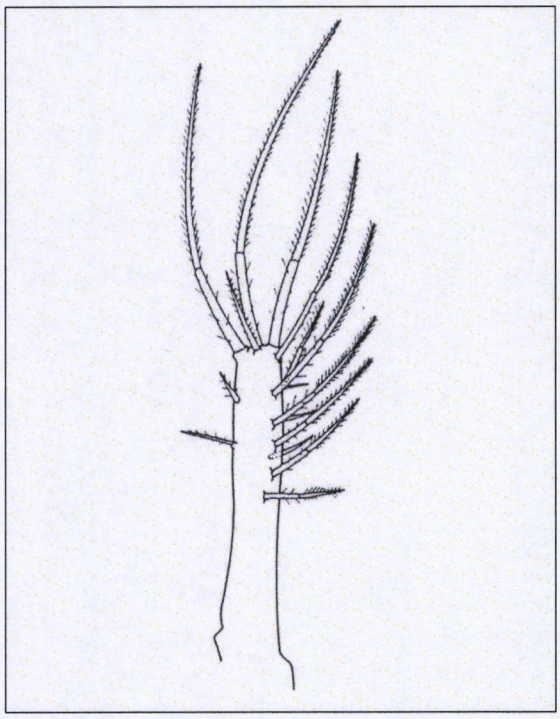


Figure 169. Illustration of an uniramous pleopod

8.5.1.3 Number of segments

This characteristic does not need a lot of illustration. In the database there are two fields on the number of segments. One for the endopod when present and one for the exopod when present. There is a limited amount of choices that can be made for the number of segments. These are illustrated in Table 43.

Number of segments
1 segment
2 segments
3 segments
4 segments
5 segments
6 segments
7 segments
8 segments
9 segments
10 segments
11 segments
12 segments
>12 segments

Table 43. Number of segments

8.5.1.4 Morphological features

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Elongated
Spines upon
Last segment claws
Last segment special
Plates
No special shape

Table 44. List of telson shapes

8.5.1.5 Description of shapes

A. Elongated To Shape list

A pleopod is elongated when it is a lot longer than the other pleopods. The elongation of the pleopod has in most cases a lot to do with the reproductive function of the pleopod. An illustration is shown in Figure 170.

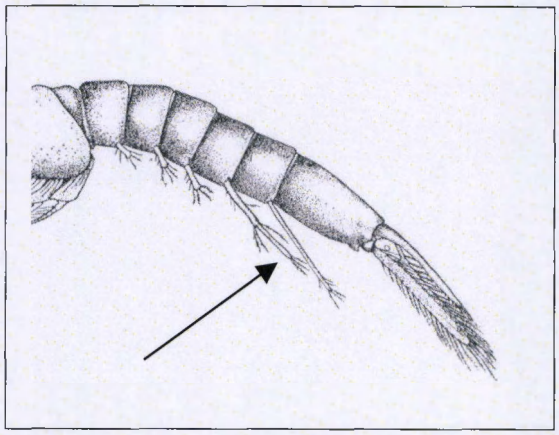


Figure 170. Illustration elongated pleopods

B. Spines upon To Shape list

This characteristic refers to the type of appendages that are present on the pleopod. In this case it only indicates that on the pleopods spines are present. This is shown in a general form in Figure 171.

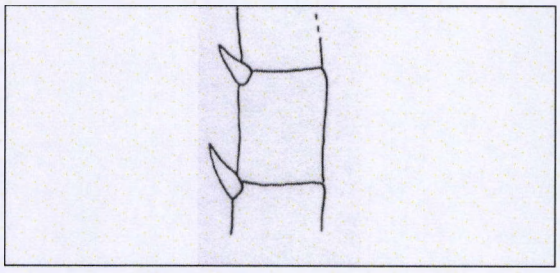


Figure 171. Illustration of spines on segments of the pleopod

C. Last segment claws

To Shape list

The last segment of exopod of a pleopod can be of a special shape. This shape is rather difficult to generalise in a limited amount of shapes. In the database the most occurring shapes are present such as claws on the last segment. This is illustrated by an example in Figure 172. On these claws further specialisation (such as spines) are possible as shown in the figure.

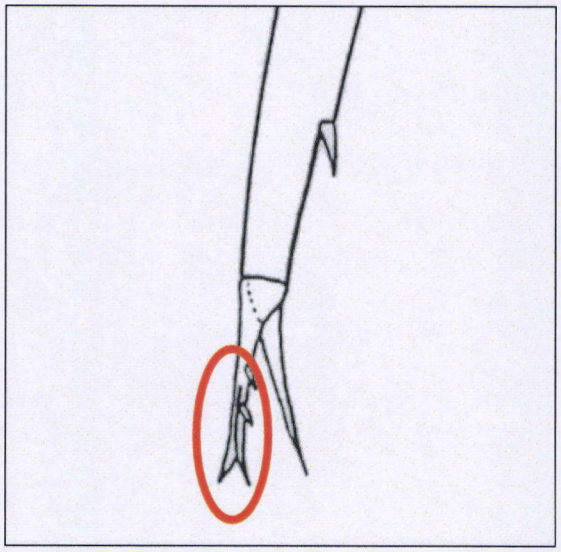


Figure 172. Illustration last segment with a claw

D. Last segment special

To Shape list

The last segment of exopod of a pleopod can be of a special shape. This shape is rather difficult to generalise in a limited amount of shapes. In the database the most occurring shapes are present but next to these there is a general possibility to choose for "last segment special". More detailed information can then be given in the remark tab. Some examples are illustrated by in Figure 173.

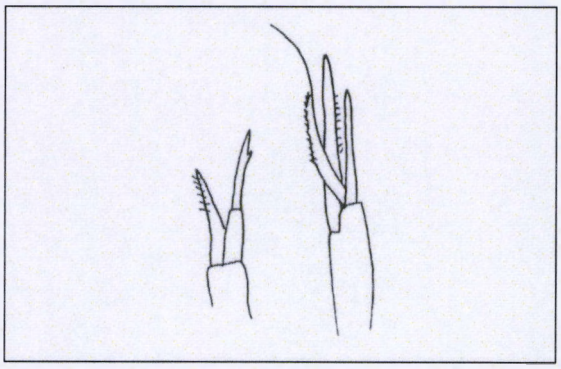


Figure 173. Illustration of special shapes of the last segment of a pleopod

E. Plates

To Shape list

In some case a pleopod can be simplified very profoundly generating in a pleopod which is no more than a plate with eventually hairs or spines upon it. This is illustrated in Figure 174. In those cases the pleopod is automatically uniramous.

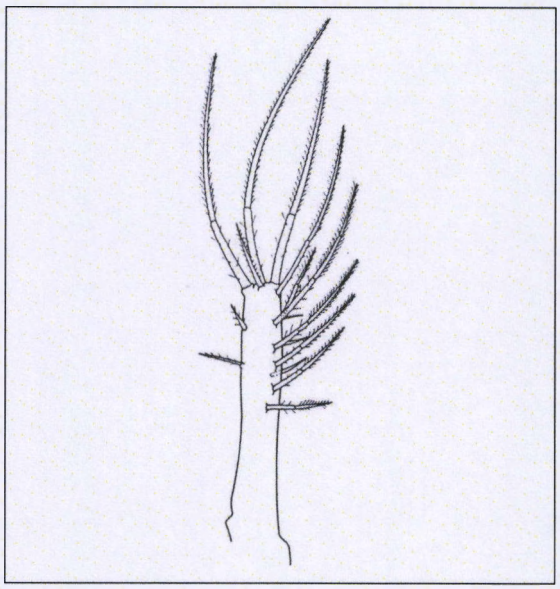


Figure 174. Illustration of a plate-like pleopod

F. No special shape

To Shape list

Sometimes the pleopods don't have any special shape of the last exopod segment. Then the last segment looks normal with no special appendages except eventually normal hairs such as on the other segments. In this case the option no special shape can be chosen.

8.5.2 Uropods

8.5.2.1 General

The uropods can be seen as the extremities of the last abdominal segment. The uropods are biramous and thus have an endopod and an exopod.
The characteristics of both the endopod and the exopod are very important to identification of the species.

8.5.2.2 Statocyst

The statocyst is a little vesicle whit a statolyth in it. In the vesicle, there are hairs that can sense movements of the statolyth. This organ could be used as auditory organ.
The statocyst does not occur in every species. It's therefore that in Mysidlan there is an option to choose whether the statocyst is present or absent. In the figure there is an illustration of what is meant by absence and presence of the statocyst.

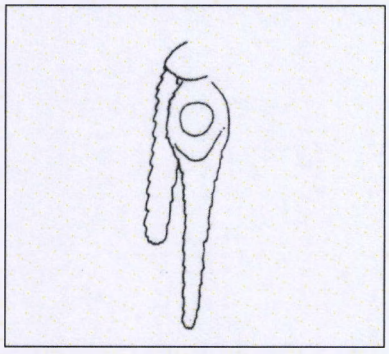


Figure 175. Illustration of uropod with endopod with a statocyst

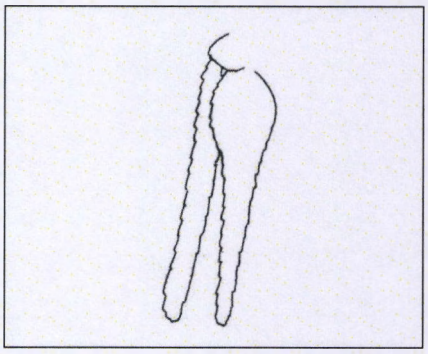


Figure 176. Illustration of uropod with endopod without a statocyst

8.5.2.3 Number of spines

The number of spines on the endopods and the exopods of the uropods are important in terms of classification. Mysidlan allows entering the maximum and minimum number of spines on the endopods and on the exopods. In this way intraspecific variation is included.

8.5.2.4 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Endopod longer then exopod
Endopod shorter then exopod
Suture on exopod
No suture on exopod
Suture on endopod
No suture on endopod
Plumose setae on endopod
Normal setae on endopod
No setae on endopod
Plumose setae on exopod
Normal setae on exopod
No setae on exopod
Special feature (see rem.)
Endopod equal to exopod

Table 45. List of uropod shapes

8.5.2.5 Description of shapes

A. Endopod longer than exopod To Shape list

The endopod (the uropod closest to the middle) is longer then the exopod as shown in the figure.

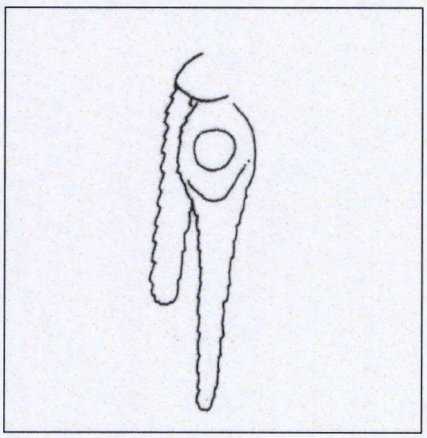


Figure 177. Illustration of uropod with endopod longer then exopod

B. Endopod shorter than exopod

To Shape list

The endopod (the uropod closest to the middle-line) is shorter then the exopod as shown in the figure.

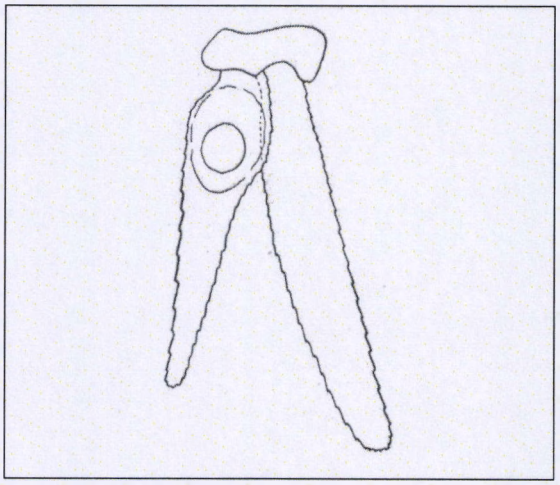


Figure 178. Illustration of endopod shorter than exopod

C. Endopod equal to exopod

To Shape list

The length of the endopod is equal to that of the exopod. This is illustrated in Figure 179.

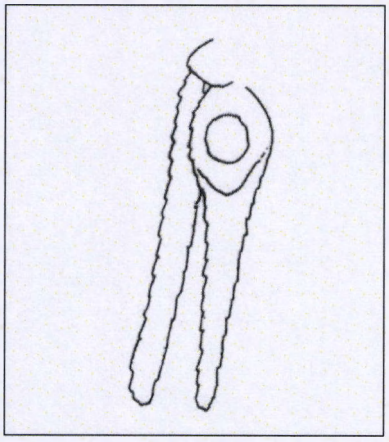


Figure 179. Illustration of uropods without equal endopods en exopods in length

D. Suture on exopod

To Shape list

On the exopod a suture is visible. It can be interpreted also as a line between two segments. An illustration of this feature is visible in the figure.

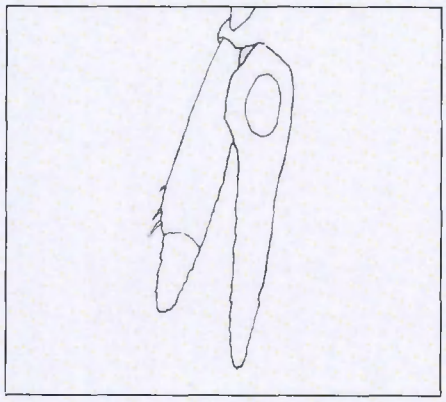


Figure 180. Illustration of a suture on the exopod

E. No suture on exopod

To Shape list

On the exopod there is no suture visible, the exopod is just one plate-like structure.

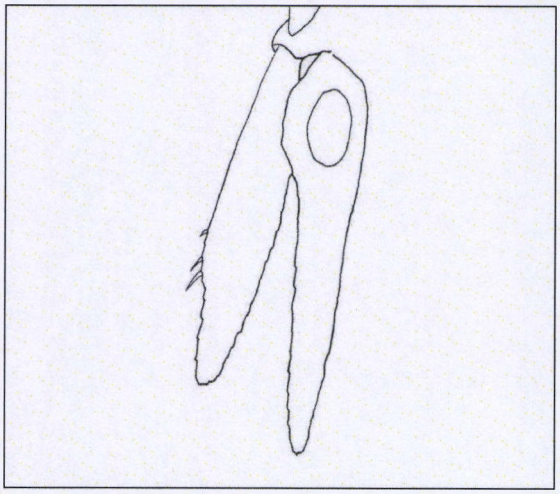


Figure 181. Illustration of an exopod without a suture

F. Suture on endopod

To Shape list

On the endopod a suture is visible. It can be interpreted also as a line between two segments. An illustration of this feature is visible in the figure.

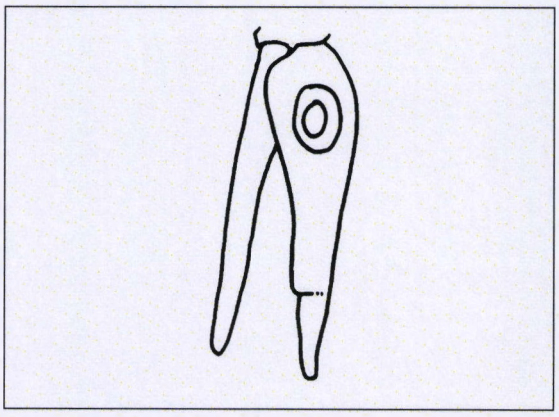


Figure 182. Illustration of an endopod with a suture

G. No suture on endopod

To Shape list

On the endopod there is no suture visible, the exopod is just one plate-like structure.

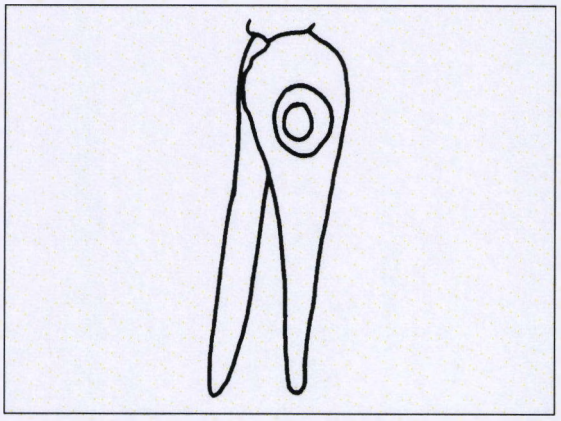


Figure 183. Illustration of an endopod without a suture

H. Plumose setae on endopod

To Shape list

This refers to the presence of plumose setae on the endopod. More than one type of setation can be chosen.

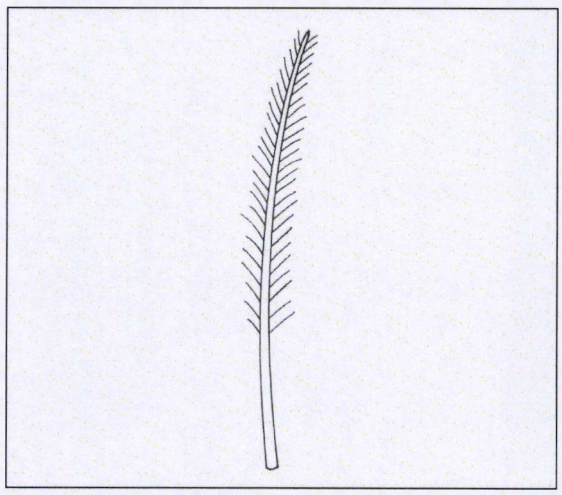


Figure 184. Illustration of a plumose seta

I. Normal setae on endopod

To Shape list

'Normal setae' are setae without any special features like plumose setae.

J. No setae on endopod

To Shape list

No setae are present on the margins of the endopods. This does not mean that the margins are naked: there can be spines or spinules.

K. Plumose setae on exopod

To Shape list

This refers to the presence of plumose setae on the exopod. It is not necessary that just one type of setation is chosen. Next to plumose setae also other types of setae can be present.

L. Normal setae on exopod

To Shape list

'Normal setae' are setae without any special features like plumose setae.

M. No setae on exopod

To Shape list

No setae are present on the margins of the endopods. This does not mean that the margins are naked: there can be spines or spinules.

N. Special feature (see rem.)

To Shape list

This possibility is included for special types of uropods. The special morphology can then be described in the remarks.

8.5.3 Telson

8.5.3.1 Telson shape

8.5.3.1.1 General

The telson is one of the basic characteristics to describe a mysid. Mysidlan stores information on the length-to-width ratio, on the number of spines and spinules and on other features of this body part.

8.5.3.1.2 List of shapes

A list of shapes present in Mysidlan is given below. These different shapes are explained more in detail in the next part.

Shapes
<NA>
Entire
Apical incision
Armed cleft
Unarmed cleft
Apical plumose setae
Apex armed
Apex unarmed
Lateral margins armed
Lateral margins unarmed
Apex truncate
Apex flat
Apex rounded
Apex pointed
Triangular
Linguiform
Medal shaped
Quadrangular
With ornamentation
Without ornamentation

Table 46. List of telson shapes

8.5.3.1.3 Description of shapes

A. Entire To Shape list

No incisions or clefts are present.

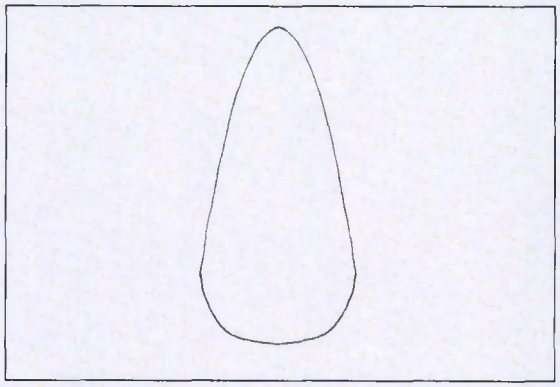


Figure 185. Illustration of an example of an entire telson

B. Apical incision To Shape list

In this case, a small indentation in the apical margin of the telson is present. An 'incision' is not as deep as a 'cleft'.

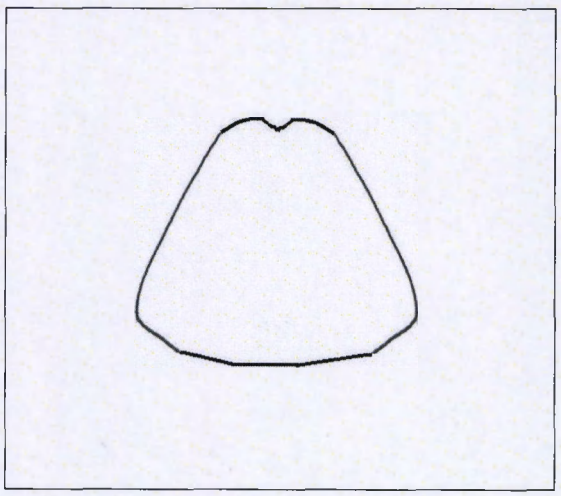


Figure 186. Illustration of a telson with an apical incision

C. Armed cleft

To Shape list

Same as apical incision, but the incision goes deeper, to about one 15th of the total telson-length.
The incision is armed with spines at the lateral margins.

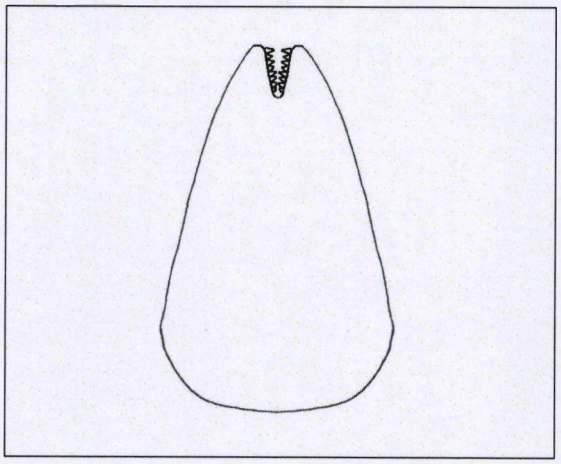


Figure 187. Illustration of a telson with an armed cleft

D. Unarmed cleft

To Shape list

Same as 'armed cleft', but without spines or other ornamentation.

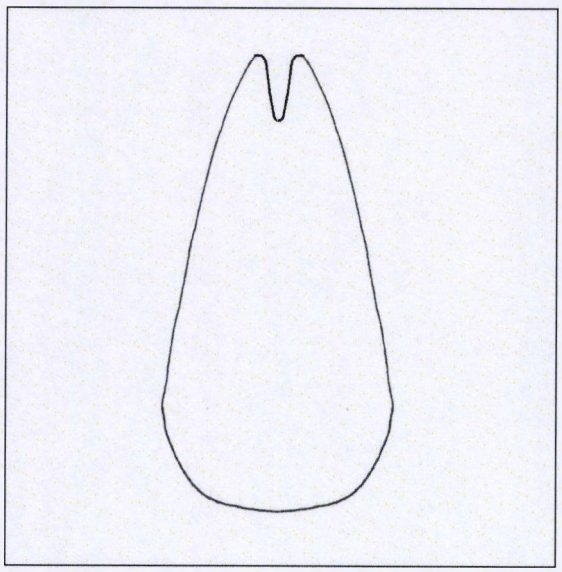
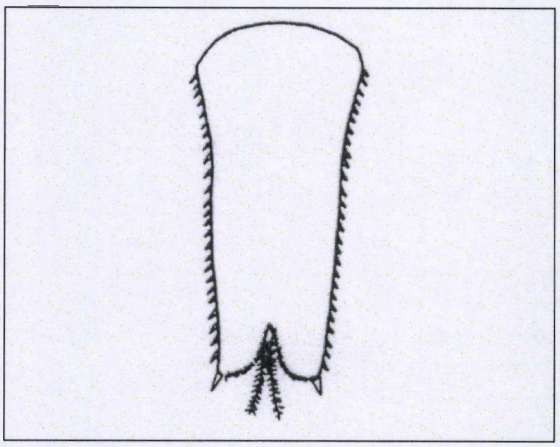


Figure 188. Illustration of a telson with an unarmed cleft

E. Apical plumose setae

To Shape list

This means that on the apical margin plumose setae can be found. Plumose setae are setae with setules upon it. In this way the seta looks like a plume.
In the figure a plumose setae is illustrated and an example of a telson with apical plumose setae.



Remark: as illustrated in the figure, apical plumose setae can be combined with other characteristics like an armed cleft in this case.

Figure 189. Illustration of a telson with an apical plumose setae

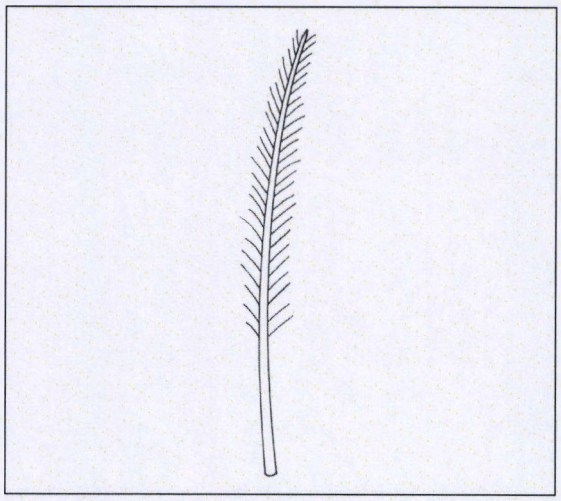


Figure 190. Illustration of a plumose seta

F. Apex armed

To Shape list

This term refers to the fact that the apex of the telson (= the most apical margin) wears spines. These spines can be just simple or wear ornamentation themselves.
This term doesn't say anything of the shape of the apex itself.

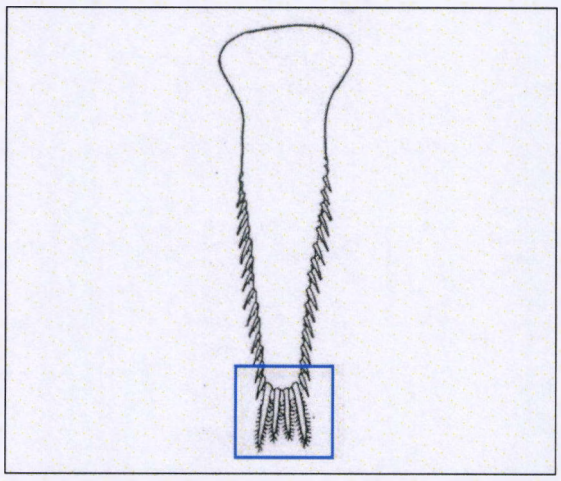


Figure 191. Illustration of a telson with an armed apex

G. Apex unarmed

To Shape list

This term refers to the fact that the apex of the telson (= the most apical margin) doesn't wear anything at all.
This term doesn't say anything of the shape of the apex itself.

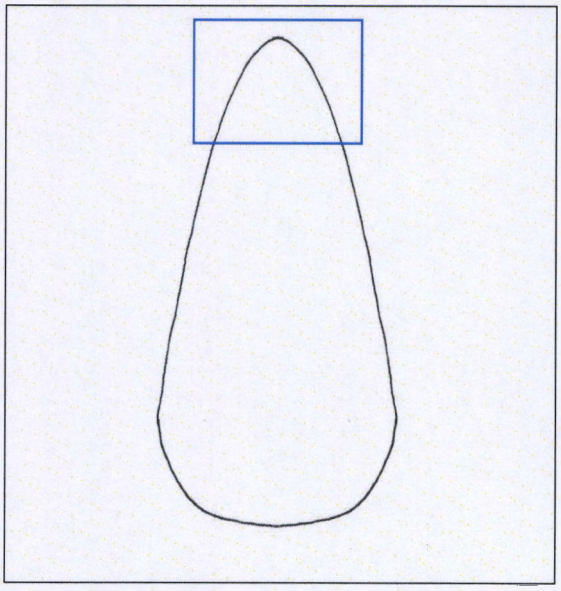


Figure 192. Illustration of a telson with an unarmed apex

H. Lateral margins armed

To Shape list

A telson with an armed lateral margin is a telson with spines on its lateral margin. This illustrated in Figure 193.

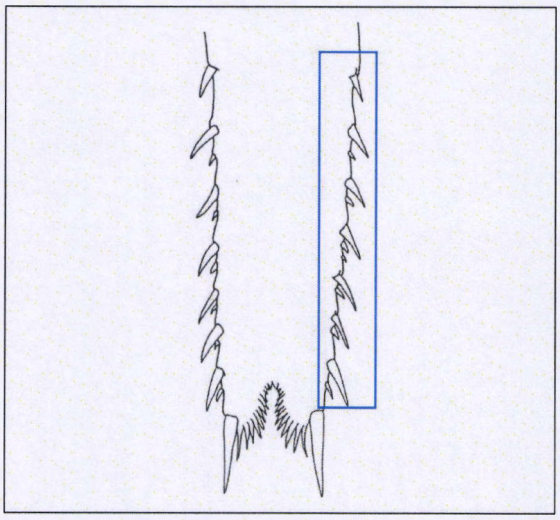


Figure 193. Illustration of a telson with armed lateral margins

I. Lateral margins unarmed

To Shape list

A telson with an unarmed lateral margin is a telson without spines or setae on its lateral margin. This illustrated in Figure 194.

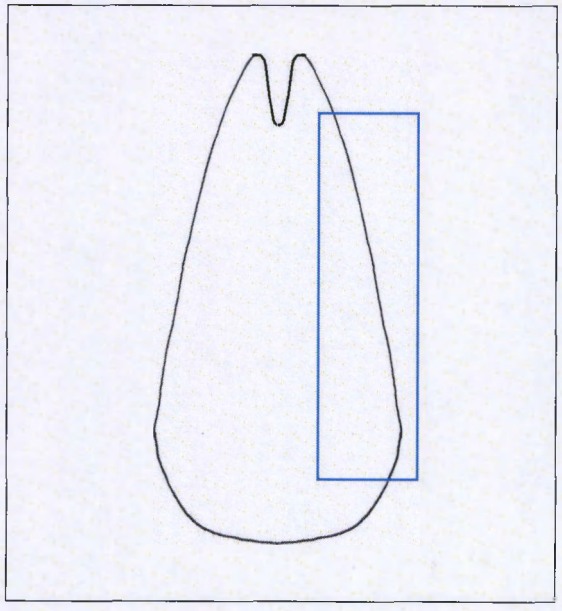


Figure 194. Illustration of a telson with armed lateral margins

J. Apex truncate

To Shape list

This term means that the apex looks like it was cut of. The telson is expected to be pointed or rounded it is not completely formed.

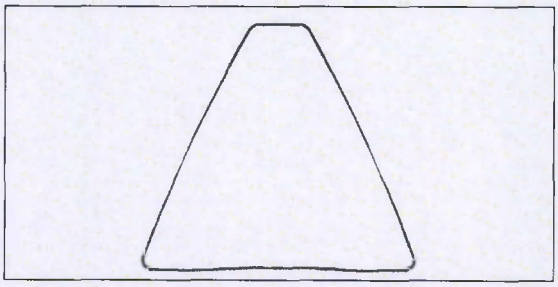


Figure 195. Illustration of a telson with truncate apex

K. Apex flat

To Shape list

The apex has no special shape. The most distal margin does not make curves but is simply flat as shown in Figure 196.

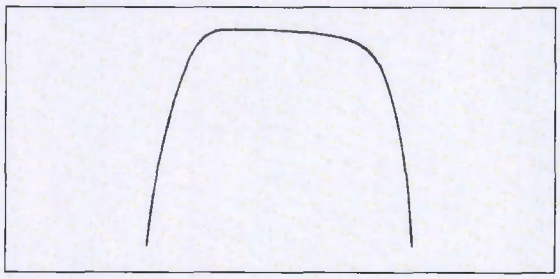


Figure 196. Illustration of a flat apex

L. Apex rounded

To Shape list

The distal margin of the telson makes a curve. This is a common type of telson. The shape is shown in Figure 197.

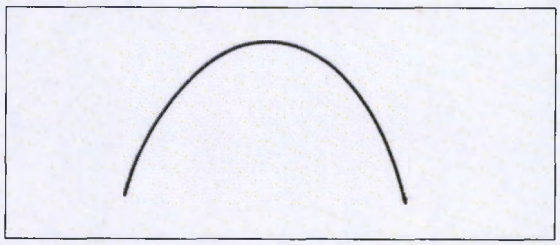


Figure 197. Illustration of a rounded apex

M. Apex pointed

To Shape list

The two lateral margins of the telson distally converge and originate in this way in a pointed apex. This is shown in Figure 198.

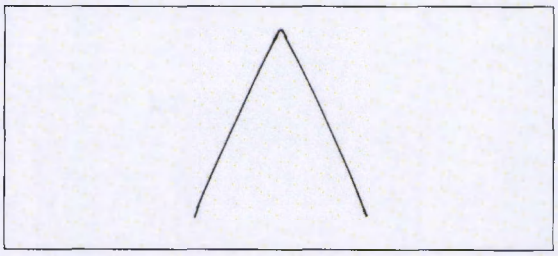


Figure 198. Illustration of a pointed apex

N. Triangular

To Shape list

The telson has a shape of a triangle. Figure 199 gives an idealised idea of this shape.

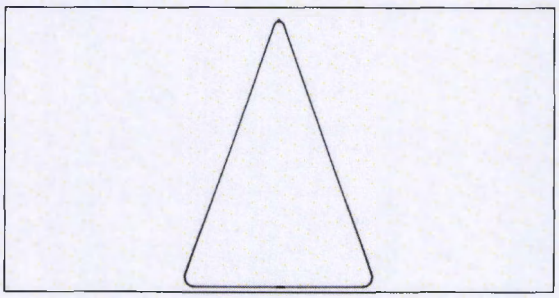


Figure 199. Illustration of a triangular telson

O. Linguiform

To Shape list

The most proximal part of the telson is the broadest part. At a certain spot the lateral margin has a sigmoid shape and generates in this way the typical linguiform shape. This is shown in Figure 200.

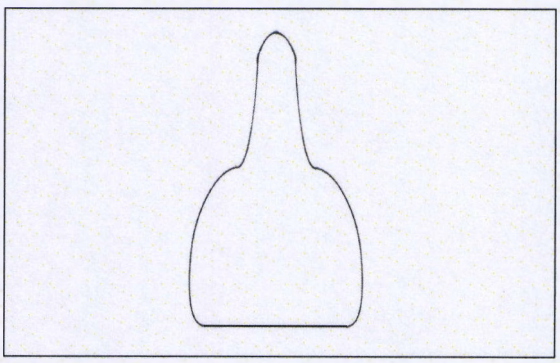


Figure 200. Illustration of a linguiform telson

P. Medal shaped

To Shape list

The lateral margins bow a t a certain place towards the middle-line and diverge again and come together in a rounded apex.

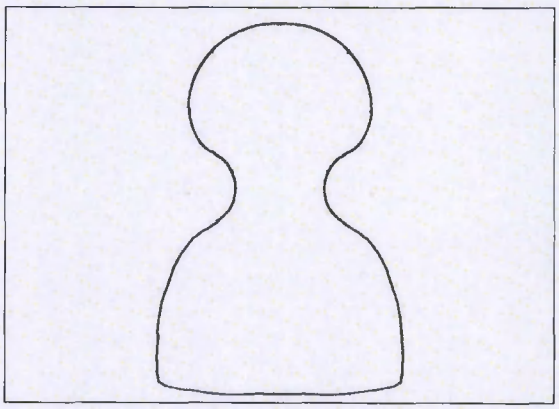


Figure 201. Illustration of a medal shaped telson

Q. Quadrangular

To Shape list

The general shape of the telson looks quadrangular as shown in Figure 202.

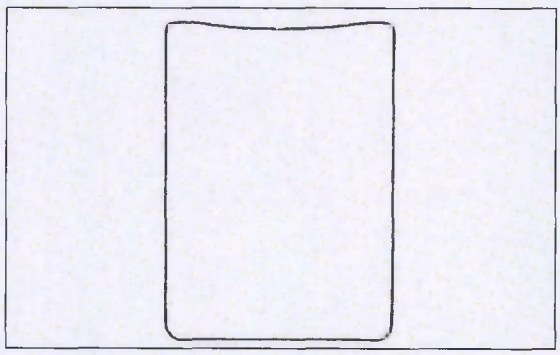


Figure 202. Illustration of a quadrangular telson

R. With ornamentation

To Shape list

This does not refer to the margins but to the dorsal or ventral side of the telson. On these planes ornamentation (little spines, setae, and other roughness) can be presented as shown in Figure 203.

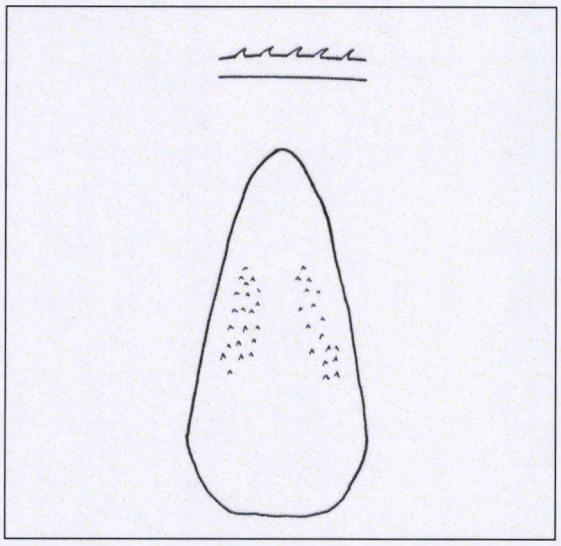


Figure 203. Illustration of a telson with ornamentation

S. Without ornamentation

To Shape list

The dorsal and ventral don't wear any ornamentation.

8.5.3.2 Spines and spinules

8.5.3.2.1 General

On the telson on the lateral and apical margins there is a possibility that there occur spines and spinules. The number of spines and spinules is important in certain genera to determinate the species. It's therefor that if possible a maximum and a minimum number of these appendages is given. When no maximum or minimum can be defined but only one value, the value of maximum and minimum are equal.

8.5.3.2.2 N° of spines on the lateral side

In the figure below the number of spines is seven. Spines are bigger than spinules. When there are three or more sizes present: the smallest ones are taken as spinules while the bigger ones in different sizes are taken as the spines. If there are two groups modification in this rule can be a solution.
Apical spines are not counted as lateral spines. In some genera (e.g. Gastrosaccus) this can be debated. When a rounded apex is present the lateral sides are taken up to the apex.

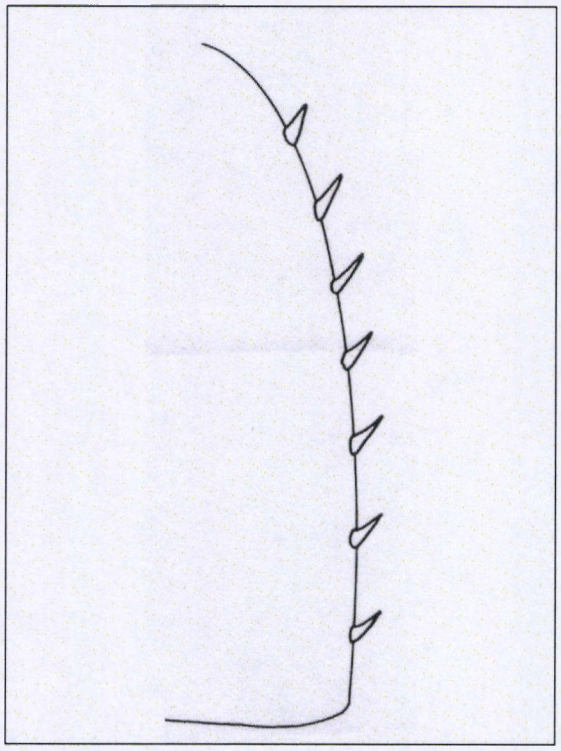


Figure 204. Illustration of a lateral side with spines

8.5.3.2.3 N° of spinules on the lateral side

In the figure below: the number of spinules is three. The number of spinules is always the number of spinules between two spines or between a distal or proximal border and a spine. The minimum value is the lowest number of spinules while the maximum number is the highest number of spinules between two spines. In the case below the min-value is 0 while the max-value is three.

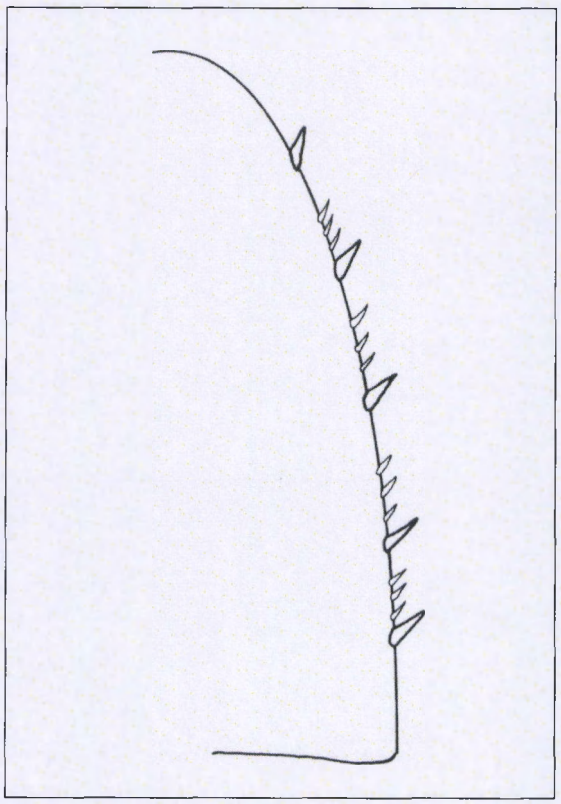


Figure 205. Illustration of a lateral side with spines and spinules

8.5.3.3 Telson ratio

The telson ratio is a morphometric value, which gives an idea of the shape of the telson. In the table some interpretations of the values are given.

8.5.3.3.1 How to calculate the ratio

The ratio is calculated by dividing the length by the width. The length is taken between the most proximal point of the telson and the most apical one excluding spines or other appendages. See figure1.
The breadth is taken between the two lateral sides at the broadest point. Some examples in the three figures below.

Dividing these two values gives the telson ratio $R = L/B$

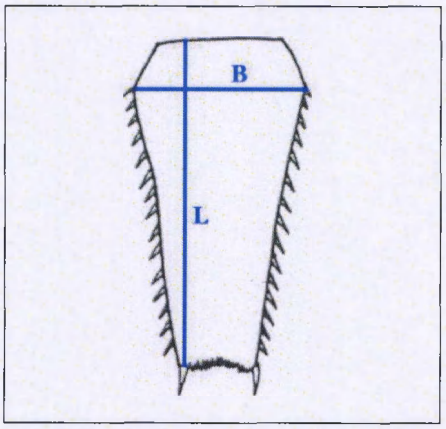


Figure 206. Illustration of telson ratio (L = length, B = width)

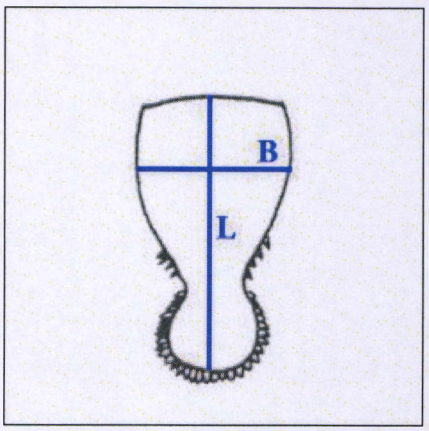


Figure 207. Illustration of telson ratio (L = length, B = width)

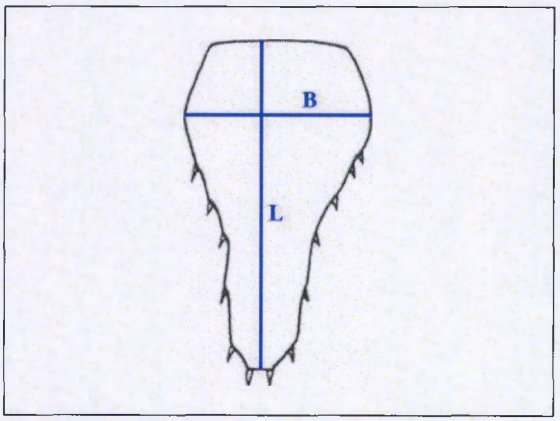


Figure 208. Illustration of telson ratio (L = length, B = width)

8.5.3.3.2 Interpretation of telson ratio

The telson ratio gives as mentioned above an idea of the general shape of the telson. In the table below some values are given with the interpretation of the value.

Value (=R)	Interpretation	Figure
< 1	Broader then long	Figure 209
1	As broad as long	Figure 210
> 1	Longer than broad	Figure 211
2	Twice as long as broad	Figure 212
3	Three times as long as broad	Figure 213

Table 47. Interpretation of telson ratios

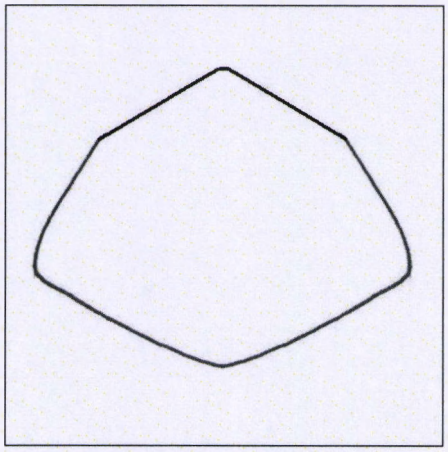


Figure 209. Telson with R < 1

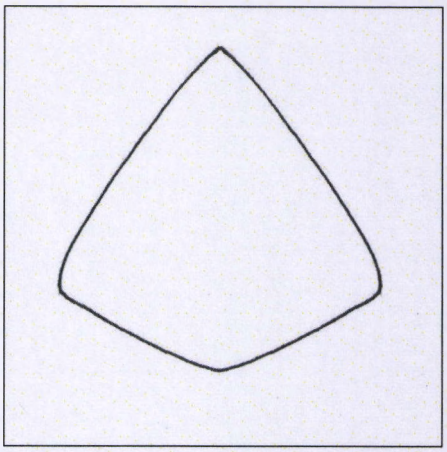


Figure 210. Telson with R = 1

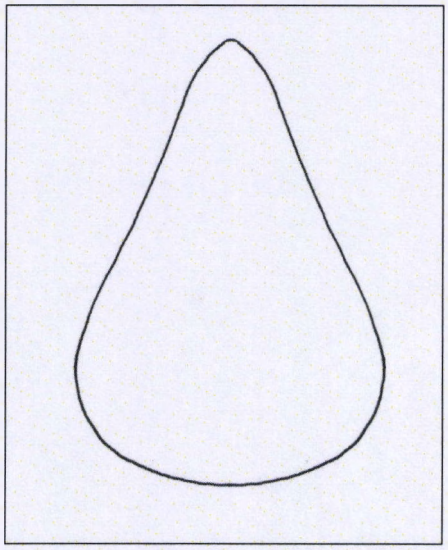


Figure 211. Telson with R >1

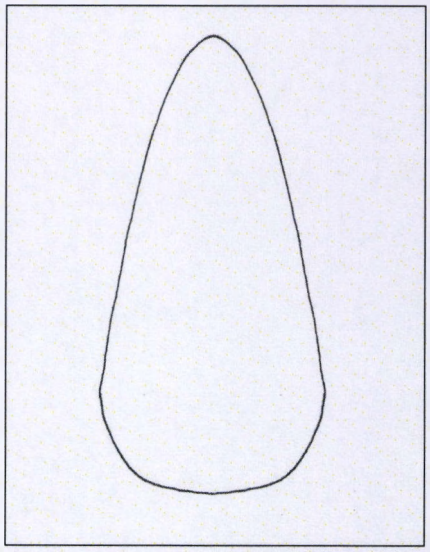


Figure 212. Telson with R = 2

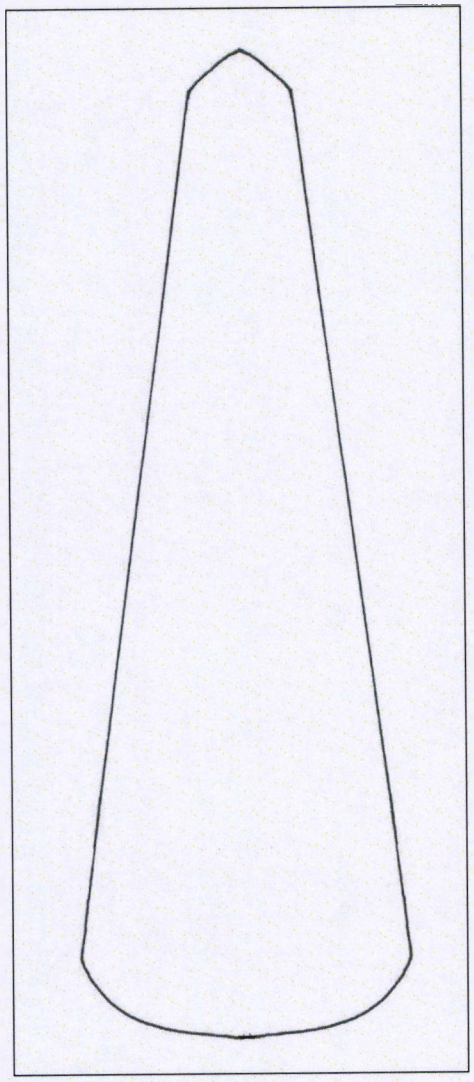


Figure 213. Telson with R = 3