

HOW TO COLLECT SHELLS OF LAND- AND FRESHWATER MOLLUSCS *)

by

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Whenever shells are mentioned remembrance and imagination evoke visions of the beach and it's rustling border of graceful relics, bright and clean as the waves that washed them ashore. Their sheer beauty lays for the picking and collecting shells would appear to be akin to art rather than to science.

Inland things are different! Shells are neither abundant nor conspicuous there and next to some knowledge concerning the habits of their builders it takes a good deal of perseverance to collect anything worth your trouble.

First of all we must know where to find them. In the heading of this paper we suggest a distinction between land- and freshwater forms. The latter are living in ponds and lakes, in ditches and rivers, in rivulets or ricefields, crawling about in the vegetation, resting on stones or floating matter or burrowing their tracks in the mud. As these tracks are clearly discernable and as you are sure to find their cause at the end, it might be a good idea to start your quest "along these lines"! Next to no training is needed for collecting these slow crawlers, as we can take them home in any kind of receptacles we brought for the purpose, such as boxes, cotton bags or glass tubes. Of course the more fragile shells should be handled carefully.

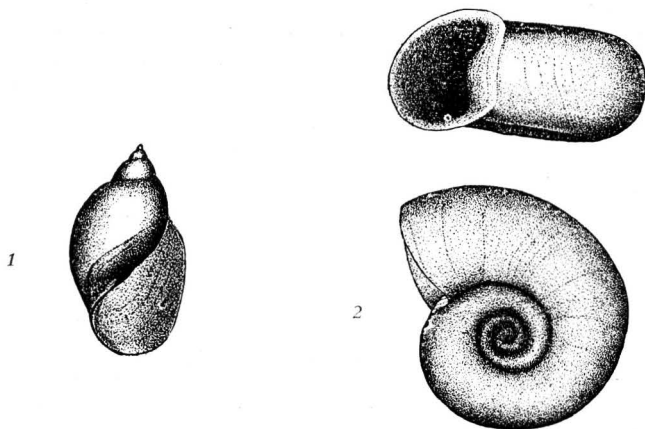


Fig. 1. *Lymnaea auricularia* (L.) race *rubiginosa* Michelin. Fig. 2 *Planorbis exustus* Desh. enlarged, Sutardja del.

*) on request.

Lymnaea (fig. 1) and *Planorbis spec.* (fig. 2) for instance are very brittle whereas *Pila* (fig. 3) and *Thiara* (fig. 4) have more solid shells. There is no need to take the animals home in water. It is even advisable to store them dry until then. *Lymnaea* and *Planorbis* are breathing with a lung. If we watch them in our aquarium (where we keep them of course for a number of other reasons) we

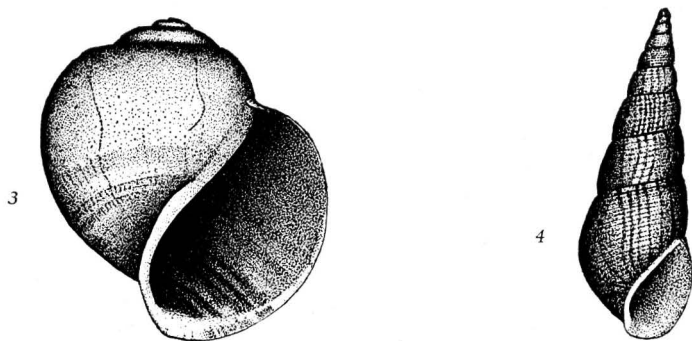


Fig. 3 *Pila conica* (Gray) nat. size. Fig. 4 *Thiara tuberculata truncatula* (Lam.) enlarged, Sutardja del.

see them rise to the surface periodically to fill this lung, resuming their submerged activities subsequently.

Prosobranchia (snails with gills) retain a sufficient supply of water in their shells as these can be closed hermetically by means of a door of some chitinous matter or lime. This door, which is more or less characteristic for each single species, is called „operculum“. Attentive inspection of waterplants dragged ashore for the purpose, of floating wood, submerged branches or stones, may disclose the presence of minute snails.

Another way of procuring these tiny forms is by searching the debris, washed ashore. After samples of these have been dried, they are easily sorted out with a lens and a forceps.

We may come across mussels too while exploring inland waters. They can be identified by their shells, which consist of two „halves“ connected by a ligament. The animal itself we discover between these „valves“ but opening them may prove a difficult proposition. Mussels usually hide in the mud, but their breathing tubes (siphon's) protrude. They can move about however and then they leave a clear track at the end of which the animal may be dug out. Large shells (8-10 cm) belong to the family Unionidae (fig. 5). They show a fine pearly layer on the inside. Smaller shells, con-

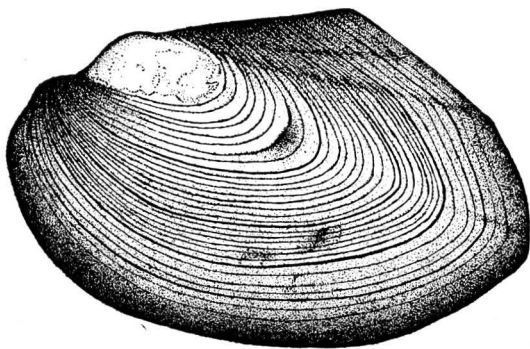


Fig. 5 *Pseudodon vondembuschianus* (Lea) fam, Unionidae. about nat. size.

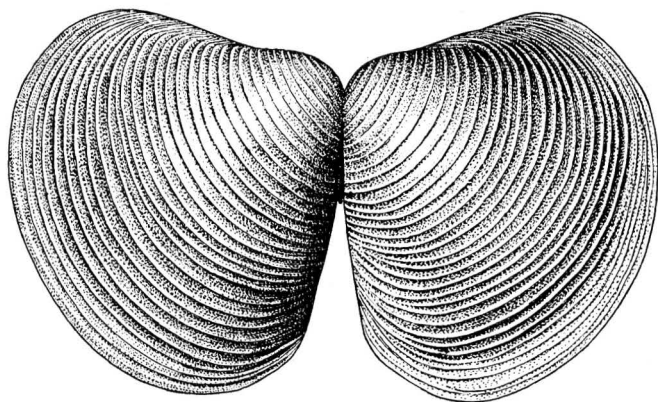
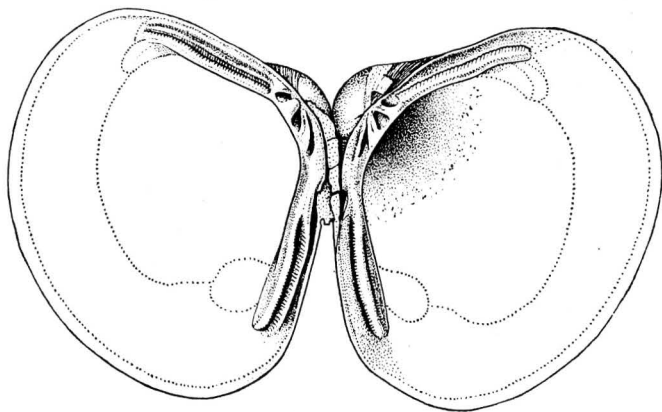


Fig. 6 *Corbicula javanica* (Mousson) Fam. Corbiculidae. Abdulkadir del,
Cliché: Berita Perikana n.

centrically ribbed outwardly belong to the Corbiculidae (to 30 mm fig. 6). In Indonesia these are known as *remies* and a great number of them lose their lives in the frying pan. Many times I saw people fishing for these shells, standing in the mud of sawah-fields and other shallow waters sieving the mud that carried mussels, by means of *aan ajakan* (bambu sieve). The minute *Pisidium* mussels are rarely found. To secure them one needs a sieve of one millimeter meshes.

On land we meet only with snails and slugs. The snails need carbonate of lime to build their spirally coiled shells and it goes without saying that most species and individuals are to be found on calcareous soils. The largest terrestrial shells of Indonesia are *Achatina fulica* (14 cm). *Amphidromus* (3-4 cm), *Rhysota* (8,5 cm, fig. 7) *Cyclophorus* (fig. 8) and *Hemiplecta* (fig. 9). There are a great number of smaller species down to 1 mm in length.

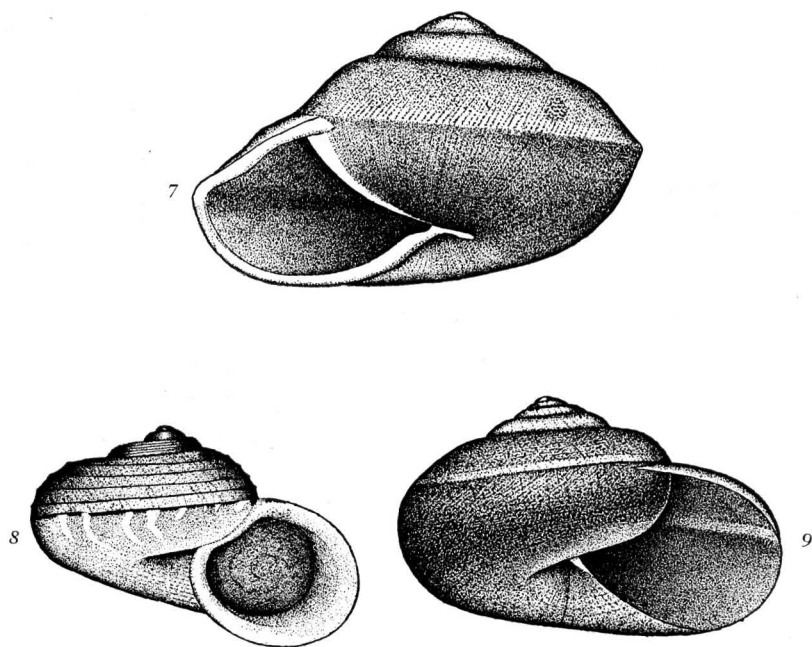


Fig. 7 *Rhysota brookei* (Ads & Rve), diam. 85 mm. One of the largest Indonesian landsnails. Fig. 8 *Cyclophorus rafflesii* (Brod. & Sow.) Fig. 9 *Hemiplecta humphreyana* (Lea)

Landmolluscs breath air and have lungs. A great many of them however are closely related to the gill-breathers from sea and freshwater. They divulge their nature by the operculum they are carrying at the back. This operculum enables the animals to close their houses. Some operculate landsnails build a kind of funnel through which they maintain contact with the air.

Snails and slugs lead an unobtrusive life. They are active during the night and in the early hours of the day. Later these moisture loving animals retire in their hiding places where sun and drought cannot harm them. If we search in the early morning their silvery tracks will lead us to their shelters under fallen trees, branches, stones and rubbish or in clefts and fissures of bark and rocks.

Many snails and slugs are true members of the soil fauna, living in moss, on or within the humuslayer of the forest, between grassroots either in the soil or over it. Others inhabit trees and shrubs. They spend the day pressed against stems and branches, or under the leaves, where they are protected from the heat. Species of the genus *Amphidromus* are living high up the trees and only heavy showers can wash the animals from the branches. After such heavy showers there is a good chance to collect *Amphidromus* alive. Again only the larger shells can be collected without much difficulty; to get micro-snails, one has to take samples from the vegetable mould. We want to have as many micro-shells as possible and sampling the mould will bring these shells into our collection in numbers. If we should like to compare the amount of shells from one sample with the yields of other samples it is necessary to make these samples comparable. The author always takes the loose mould of a surface of 30×30 cm. Branches, dead leaves and stones are

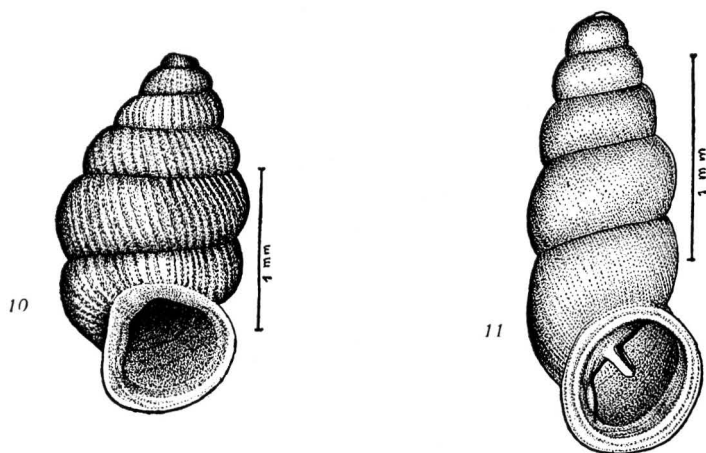


Fig. 10 *Diplommatina hortulana* Leschke, enlarged. Fig. 11 *Carychium javanum* Mlldff. enlarged, Sutardja del.

put aside after inspection, and the mould is put into a cotton bag. At home the contents are spread out on a tray to dry. By means of three sieves of different gauze the dry sample is differentiated in three fractions. The fraction of particles smaller than one half of a mm may be ignored. The bigger fractions are sorted out with the help of a hand lens, forceps or long needles. The wet needle point will pick up any small shell without crushing it as tweezers often do. The smaller species procured in this way belong to genera like *Diplommatina* (fig. 10), *Carychium*, (fig. 11), *Liardetia* or *Microcystina*. Larger forms to *Opeas*, *Durgellina*, *Subulina* or a number of other genera. Sorting the shells is rather laborious but in this country it is always worthwhile and it creates a sphere of Boxingday.

A separate molluscan fauna inhabits the limestone rocks. Among it are minute shells which can be picked from the rocks provided they do not evade our forceps in small crevices or clefts. The snails are grazing microscopical algae from the rocks and die in due time. Their handsomely shaped and beautyfully sculptured shells remain. Rainwater washes these micro-shells down the rocks and carries them to the sand underneath. The water disappears and the shells will stay there under the overhanging rocks. Slip the dry sand through your fingers and soon enough you will find out that sampling may be worth your trouble. Once home we tackle this sample in a new way. The material is dry and the shells in it are empty but for the air in the whorls. So we pour out the sample into some vessel filled with water. Sand and stones will settle, the shells and vegetable matter will float. Skim the latter off with a small sieve and dry. Afterwards you may have a good time when sorting your treasures!
