A Method for shipping Freshwater Mollusks

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Possibilities for malacological investigations are naturally best in more highly civilized areas where there are large institutions which foster research. This is obvious if we note how little research is done in South America and Africa, as compared with that done in North America and Europe. However, such institutions as foster research are all too often not so advantageously situated as to make live material readily available. This is significant, since we are finding a greater premium placed on live material in the solution of many of our problems. But, as a rule, the living specimens necessary can be obtained only from localities more or less distant from the laboratories where they can be suitably studied. There is, therefore, an increasing need for knowledge regarding means for the successful transportation of these specimens from the collecting grounds to the laboratory. The writer, in working with freshwater shells, has found the following method quite successful.

In shipping live material, freshwater mollusks present a special problem. As a rule, shipment is difficult because of many inherent difficulties involving the welfare of the specimens, as well as the cost of shipping. Some of these obstacles have been overcome by using *Sphagnum*[1] moss as the shipping medium. This moss is particularly useful because it serves so well as a water reservoir. Its leaves with their large porous cells not only store an ample supply of water, but also act by capillary conduction to distribute it to all parts of the shipping container. This supplies the specimens being shipped with sufficient moisture to insure a successful transportation from the collecting ground to the laboratory. The

[1]) The following article contains some interesting data on the structure and use of *Sphagnum:* Nichols, George E., *Sphagnum* moss: war substitute for cotton in absorbent surgical dressings, from Smithsonian Report for 1918, pp. 221—234.

costs of shipping are considerably reduced since there is a great reduction in weight per volume of moist *Sphagnum* as compared to the weight of an equal volume of water.

Sphagnum is especially useful because of its wide distribution. It is widely distributed throughout Eurasian regions, as well as in North America. Dr. W. C. Steere, who is studying mosses, informs me that there are many representatives of this genus in the tropics which would serve equally well for shipping. In America, *Sphagnum* is used widely by nurserymen for transporting bulbs and plants, so that where it is not available in the field, quantities are procurable on the market by those in need of it. The writer has found it very convenient to pack several shipping containers with dried *Sphagnum* before starting on an expedition. Such containers can be properly labelled and addressed. Then, as live material is obtained it can be placed in the containers with the properly moistened *Shagnum* and shipped back to the laboratory without delay.

This method has proved unusually successful. An instance of its successful application is the shipment in 1934 of a series of live *Campeloma* collected in the region of Ann Arbor, Michigan, U.S.A., and shipped to Dr. W. Adam at the Musée Royal d'Histoire Naturelle de Belgique, at Brussels. Upon receiving these specimens, Dr. Adam wrote, "Last week I received your letter and this morning the parcel with the Mollusks arrived in due order. Only seven specimens were dead, the rest (several hundred) is in excellent condition." When we consider that that shipment took roughly ten days to reach its destination, we cannot but be impressed with the suitability of *Sphagnum* for such purposes. The writer has used this method many times in shipping live freshwater mussels from Ann Arbor, Michigan, to Dr. John H. Welsh at Harvard University, Cambridge, Massachusetts, a distance of about seven hundred miles. None of those shipments has ever failed. There is, therefore, ample evidence that this method could in many instances be applied to great advantage. The use of *Sphagnum* for shipping is not new, since it has

been used for many years in various industries. However, it has an extensive application in the field of Malacology, and it is hoped that it will in the future be used to even greater advantage. The many improvements in modern transportation will undoubtedly do much to contribute toward this end.

Samenvatting.

Een methode voor het verzenden van zoetwatermollusken.

Voor het oplossen van vele problemen is het bestudeeren van levende exemplaren van mollusken gewenscht, doch als regel worden de exemplaren niet onmiddelijk in de nabijheid verzameld van laboratoria, waar men ze kan onderzoeken. Daardoor is het noodig de exemplaren op te zenden naar een laboratorium, waarvoor schrijver een doeltreffende methode gevonden heeft. Het verzenden van zoetwatermollusken is bijzonder moeilijk, daar de dieren moeilijk in leven te houden zijn en het verzenden kostbaar is. Hierbij kan *Sphagnum* (Veenmos) behulpzaam zijn. Dit mos doet dienst als waterreservoir; het neemt veel water op en staat het geleidelijk aan den inhoud van het pakje af. Daardoor behoeven de voorwerpen niet in water verzonden te worden, waardoor de kosten van het verzenden lager worden. Het vochtige *Sphagnum* weegt veel minder dan hetzelfde volume water.

Sphagnum komt voor in Europa en N. Amerika, terwijl in de tropen verwante soorten voorkomen, die voor het doel bruikbaar zijn. Het is verkrijgbaar bij bloemisten. Schrijver pakt voor hij op reis gaat eenige doosjes vol droog *Sphagnum*. Het verzamelde levende materiaal wordt in bevochtigd *Sphagnum* verpakt en direct aan het laboratorium verzonden. Hoe doeltreffend de methode is, blijkt wel uit het feit, dat schrijver vanuit Ann Arbor aan Dr. A d a m in Brussel eenige honderden levende exemplaren van *Campeloma* toezond, waarvan er slechts 7 gestorven waren bij een vervoer, dat ongeveer 10 dagen duurde. Bij het verzenden in Amerika naar Cambridge, over een afstand van ruim 1100 K.M. had schrijver steeds veel succes. Het verpakken in *Sphagnum* is niet nieuw, doch kan voor de Malacologie nog veel nut afwerpen.