MALACOLOGY DATA NET

Contents

ECOSEARCH SERIES VOL.I , NO. 3

Malacology Data Net (Ecosearch Series), vol. 1, no. 3; August 26, 1986

ANNOUNCEMENT

Malacology Data Net (Ecosearch Series) is a new and unique journal devoted to the prompt dissemination of scholarly, innovative, and timely information in malacology. Subscriptions are now being offered and manuscripts are solicited.

Good research builds on the work by others, but if discoveries are made available only through conventional journals which take a year to publish, progress in malacology will be so slow that our goals of preserving and understanding the enormous diversity of molluscan life on earth will not even be approached before most of it is destroyed. In addition, too much research momentum is lost, the joy of science is quelled, and too many opportunities for valuable contributions to active research programs, by amateurs and other professionals, will continue to slip by.

"Data Net" will specialize in those areas where the need for rapid publication is clearly indicated. Additional special features of the journal are:

- six numbers per year (about 150-175 pages) produced by offset, using good quality paper and an 8½ x 7 inch format;
- peer review and editing by professional malacologists;
- prompt publication: most manuscripts will be published within eight weeks following acceptance;
- a vehicle for the sale of un-needed literature, etc.
- broad accessibility: several major institutions already receive the journal and imminent world-wide distribution is anticipated;
- inexpensive: $14.50 per year in North America, $18.00 per year outside North America

Arthur H. Clarke, Editor
ECOSEARCH, Inc.
(Telephone: (512) 643-1689)

NEW RECORDS FOR HELIX ASPERSA MÜLLER IN TEXAS

Jane E. Deisler
Corpus Christi Museum
1900 N. Chaparral
Corpus Christi, TX 78401

ABSTRACT

Recent field work and examination of specimens in the collections of the Corpus Christi Museum and the Florida State Museum show that the brown gardensnail, Helix aspersa Müller, now occurs in Nueces and Kerr Counties. Previously published accounts indicate this species can be found in 11 other Texas counties also.

INTRODUCTION

Helix aspersa Müller, the brown gardensnail, has a long history as a tramp species. From its native range in Great Britain, western Europe and the shores of the Mediterranean and Black Seas, this species has been introduced into many tropical and subtropical areas of the world, where its herbivorous habit often causes much damage to crops and garden plants. The most notable introduction in North America is in the state of California, where H. aspersa was introduced in 1859 as a food item and is now an important agricultural pest in cultivated habitats (Hanna, 1966). It is the subject of legal actions and quarentines in many states, including Texas (R. Fullington, pers. comm.). A brief summary of the history of this species in California and the Western states is available in Selander and Kaufman (1975) who indicate that the California populations are limited by snowfall and extreme aridity. The eastern introductions are summarized by Dundee (1974).

The first account of Helix aspersa in Texas was that of Strecker (1935), when he reported its presence in Waco, McLennan County. The snail was also introduced into Bryan, Brazos County, in the early 1930's from California (Selander and Kaufman, 1975). Densities in Bryan have ranged from 2,218 snails on two city blocks in the 1970's (Ibid, 1975) to only a few snails found now (R. Neck, pers. comm.). Since 1975, the brown gardensnail has been

reported in other counties (Fig. 1), but has remained primarily restricted to cultivated and irrigated areas. These counties are: Harris County in 1960 (McGee, 1970-1972; Dundee, 1974; Selander and Kaufman, 1975), Dallas County in 1962 and Tarrant County in 1963 (Pratt, 1964; Dundee, 1974; Fullington and Pratt, 1974; Murray and Roy, 1968), Brewster County (Cheatum et al., 1972;

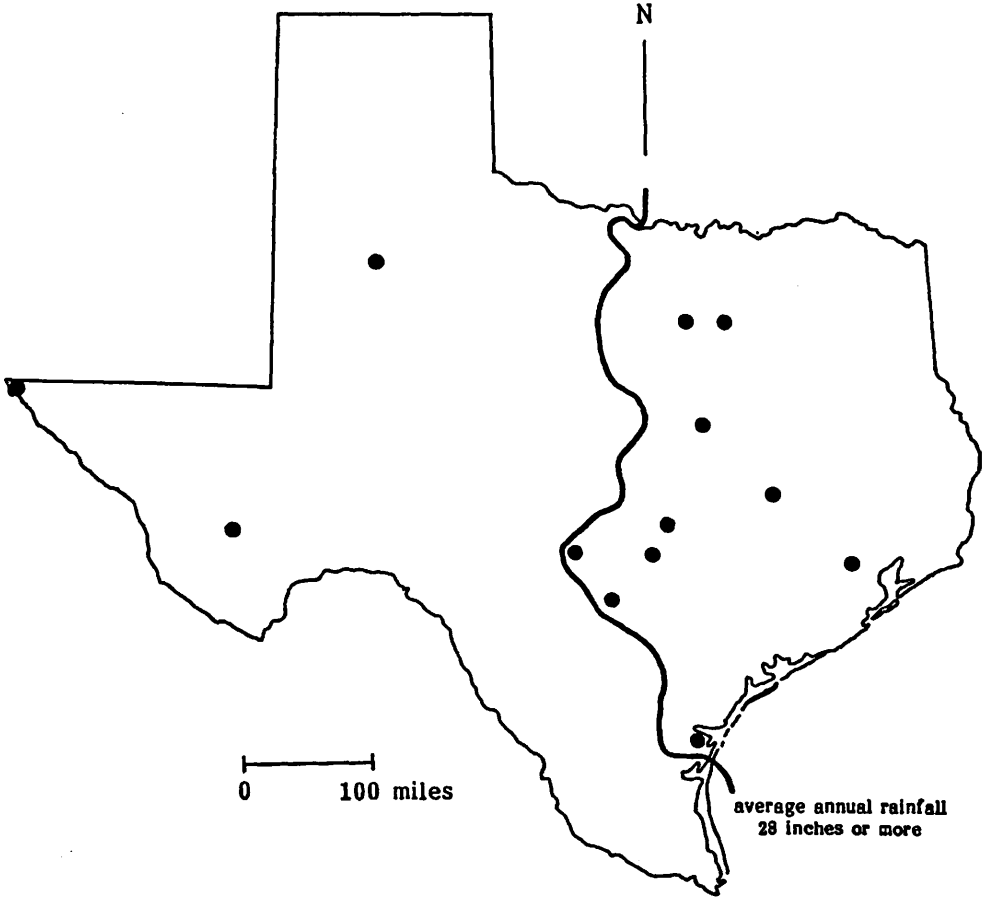

Figure 1 - Distribution of reported colonies of Helix aspersa Müller, the brown gardensnail, in Texas by counties. All counties lying east of the marked rainfall line receive more than 28 inches per year on average (to a maximum of 56 inches per year).

Dundee, 1974), El Paso and Hays Counties (Dundee, 1974), Bexar County in 1968 (Dundee, 1974; Selander and Kaufman, 1975), Travis County (Selander and Kaufman, 1975; Neck, 1977a,b), and Lubbock County (Neck, 1977a). Little has been written about the pest potential of the introduced populations in Texas.

SPECIMENS EXAMINED

Kerr County: CCM-71S714 (Centerpoint); Harris County: UF-300075 (Houston, 2331 North Boulevard); Nueces County: CCM-71S711 (Corpus Christi), CCM-71S713 (Corpus Christi, corner of Alameda and Robert), CCM-74S364 (Corpus Christi, 5800 block of Alameda), CCM-77S123 (Corpus Christi, Woodlawn School area), CCM-81S075 (Corpus Christi, 1801 Yale), CCM-86S474 and CCM-86S475 (Corpus Christi, 910 Delaine);

DISCUSSION

As is the case in many of the Texas localities for the species, Helix aspersa Müller is found in Corpus Christi in isolated colonies in landscaped areas, primarily homesites (Fig. 2). As in Travis County (Neck, 1977b) the periodic and cyclical extremes of dryness that the Coastal Bend undergoes limit the spread of the snails from irrigated areas and may have prevented the survival of other introduced colonies.

Undoubtedly multiple introductions have occurred from areas such as Houston, where H. aspersa was first established in 1960 (McGee, 1970-1972), and where substantial (up to 1000 specimens collected) colonies still survive in at least two separate areas of the city (Kurt Auffenberg and Raymond Neck, pers. comm.). One Corpus Christi colony in fact can be traced to Houston. The specimens from the corner of Alameda and Robert, in Corpus Christi, arrived originally on nursery stock from Houston in the late 1960's when there was a nursery and landscape business at that locality (John Kline, pers. comm.).

All known Corpus Christi localities are in an older residential part of the city, where houses and landscaping are generally at least 10-20 years old. There is a possibility that nursery stock was the source for all five localities, perhaps in some cases from the same nursery sources. However, multiple introductions are most

likely, because it is known that at least at one site the snails have been observed by the homeowners over only the past two years (CCM-86S474 and CCM-86S475). It may be possible that the colonies are not actually persisting, but that serial introductions to the same sites maintain the illusion of survival. This is exemplified by the Dallas nurseryman who received annual shipments of roses and of Helix aspersa (Pratt, 1964).

The population density of the Corpus Christi colonies is much lower than in Houston. Generally, residents of the area notice only an occasional adult snail exposed to view but sometimes will see 6-10 adults during a casual search of the infested areas. However,

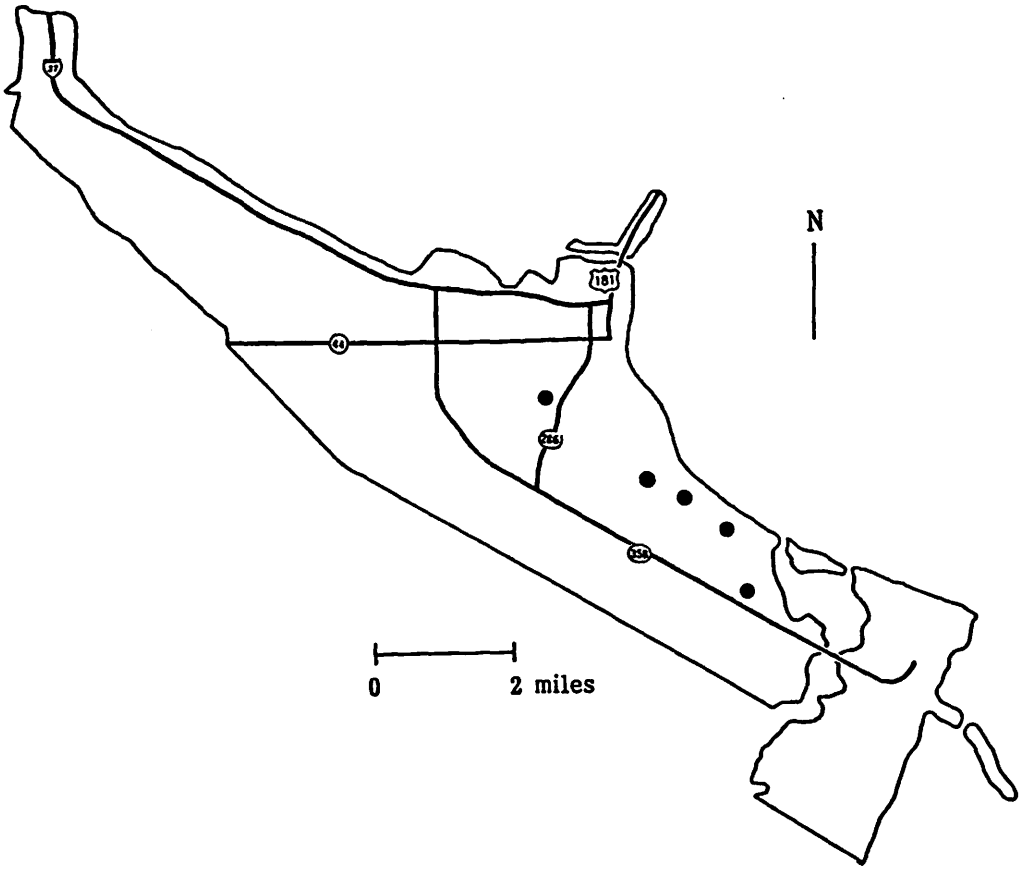

Figure 2 - Distribution of Helix aspersa Müller colonies in Corpus Christi, Texas.

major damage to the leaves of Amaryllis sp. is reported by homeowners, as well as some damage to ferns and other non-native plants. The snails are most frequently found in landscaped beds under low-growing ground covers and dead leaves, emerging during rainfall or irrigation (Joyce McLerran, pers. comm.). They have been observed to aestivate in the open crawlspaces underneath the houses and also have been found, epiphragm in place, under dead leaves.

Not as much is known about the specimens from Centerpoint, Kerr County. Data with the specimens indicate that the snails were found in moist areas and under rocks. No further information is available to indicate whether the colony has naturalized or is restricted to cultivated lands, nor is there any information on the density and extent of the population.

Because of the large area over which scattered colonies of Helix aspersa have been discovered since the time of its first report and because of the active nursery industry in Texas and between Texas and California, it is likely that there are many other localities in the state where the snail occurs, but some restrictions apply. In many areas of Texas the same potential limits to the spread of Helix aspersa exist as are present in California. These take the form of the arid portions of the Edwards Plateau and Trans Pecos, and the cold winter areas such as the High Plains, which receive larger amounts of snowfall yearly (10 inches and above). Helix will only be able to survive in these areas under unusual and protective circumstances, as do the colonies established in Arizona (Mead, 1963).

The majority of published accounts (10 out of 13) report colonies in areas where the 30-year average annual precipitation is more than 28 inches per year (Fig. 1), the exceptions being Alpine (14.83), El Paso (7.82) and Lubbock (17.76) (Bomar, 1983), where colonies may be subject to protective microenvironments. It is not known how much rainfall this species requires to survive, but the distribution of Texas records implies that at least 28 inches per year is needed, unless there is an alternative source of moisture. The high density of the populations in Houston and the lower densities to the west argue that 28 inches of rain may be sufficient only for survival of the colonies, while greater amounts of precipitation are needed to ensure that the population flourishes and expands.

In East Texas and along the upper Gulf Coast, where Houston lies, precipitation levels range from 40 to 56 inches per year, very little of which is snowfall. It is in this part of Texas that there is a potential for Helix aspersa to become well established in dense colonies. Field investigations in this area will undoubtedly discover more colonies of this adventive species. In the Coastal Bend and Central Texas it is more likely that H. aspersa will be restricted to irrigated habitats and will not become naturalized.

SUMMARY

Helix aspersa was first reported in Texas in the 1930's. Since then colonies have become established in 13 different counties, generally associated with human population centers. Where sources can be traced, the nursery trade is responsible for the spread of the species in Texas. Helix has not yet been reported from other areas of the state but is probably to be found in any irrigated area where winter temperatures fall only briefly below freezing. Naturalization potentially can occur only in areas of high rainfall in East Texas and along the upper Gulf Coast.

ACKNOWLEDGMENTS

My thanks to Kurt Auffenberg for searching the Florida State Museum collections, Raymond Neck for comments on this paper and field observations, Arthur Clarke for his comments, and Joyce McLerran for material donated to the Corpus Christi Museum.

LITERATURE CITED

Bomar, G. W. 1983. Texas Weather. University of Texas Press, Austin, Texas. 265 pp.

Cheatum, E. P., Fullington, R. W. and Pratt, L. 1972. Molluscan records from west Texas. Sterkiana 46:6-10.

Dundee, D. S. 1974. Catalog of introduced molluscs of eastern North America (north of Mexico). Sterkiana 55:1-37.

Fullington, R. W. and Pratt, W. L., Jr. 1974. The aquatic and land Mollusca of Texas. Part Three: The Helicinidae, Carychiidae, Achatinidae, Bradybaenidae, Bulimulidae, Cionellidae, Haplotrematidae, Helicidae, Oreohelicidae, Spiraxidae,

Streptaxidae, Strobilopsidae, Thysanophoridae, Valloniidae (Gastropoda) in Texas. Dallas Museum of Natural History, Bulletin 1(3):1-48.

Hanna, G. D. 1966. Introduced mollusks of western North America. Occasional Papers of the California Academy of Sciences 48:1-108.

McGee, P. 1970-1972. Distribution and ecology of the terrestrial mollusks of the Texas coastal counties. Texas Conchologist 7(2-8):13-16, 25-28, 37-40, 49-52, 61-64, 73-76, 85-88; 8(2-5):13-16, 25-28, 39-42, 53-57.

Mead, A. 1963. Foreign mollusks in Arizona. Sterkiana 9:27.

Murray, H. D. and Roy, E. C., Jr. 1968. Checklist of fresh-water and land mollusks of Texas. Sterkiana 30:25-42.

Neck, R. W. 1977a. New county records of land snails of Texas. Sterkiana 65-66:5-6.

Neck, R. W. 1977b. Introduced land snails of Travis County, Texas. Nautilus 91(4):140-143.

Pratt, W. L., Jr. 1964. Some Texas localities for Helicidae. Nautilus 78(1):31-32

Selander, R. K. and Kaufman, D. W. 1975. Genetic structure of populations of the brown snail (Helix aspersa). I. Microgeographic variation. Evolution 29(3):385-401.

Strecker, J. K. 1935. Land and fresh-water snails of Texas. Transactions of the Texas Academy of Science 17:4-44.

LIMAX FLAVUS LINNE IN CORPUS CHRISTI, TEXAS

Jane E. Deisler
Corpus Christi Museum
1900 N. Chaparral
Corpus Christi, Texas 78401

Limax flavus Linné, a european herbivorous slug, was collected recently in the Annaville area of northern Corpus Christi, Nueces County, Texas. The homeowners first noticed the introduction in

their garden several months ago, shortly after a new tree (Schinus sp.) had been obtained on Navigation Street, in central Corpus Christi. The slugs are restricted to a wet area in a planting bed under a faucet in the front yard. They are found under bricks and pieces of wood, or in the bed itself, where they burrow into the moist soil. Two adult specimens were deposited in the collections of the Corpus Christi Museum (CCM-86S477, Corpus Christi, 4202 Sierra) and further investigation is underway on the full extent of the distribution of this species in Nueces County and on possible sources for the introduction.

No other specimens of Limax flavus have been reported previously from southern Texas, but the species was first collected in the state in 1923 (Pilsbry, 1948). Published records indicate that it is known to be introduced into seven other Texas counties, including McLennan (Strecker, 1935), Nacogdoches and Harris (Pilsbry, 1948), Comal (Wheeler, 1949), Tarrant (Dundee, 1974), Travis (Neck, 1977a, 1977b), and Taylor (Beasley & Fullington, 1978).

My thanks go to Mr. and Mrs. Tom Nutter, who first brought this introduction to my attention.

LITERATURE CITED

Beasley, C. W. & Fullington, R. W. 1978. Gastropods of Taylor County, Texas. Sterkiana No. 69-70:1-2.

Dundee, D. S. 1974. Catalog of introduced mollusks of eastern North America (north of Mexico). Sterkiana No. 55:1-37.

Neck, R. W. 1977a. Introduced land snails of Travis County, Texas. Nautilus 91(4):140-143.

Neck, R. W. 1977b. New county records of land snails of Texas. Sterkiana No. 65-66:5-6.

Pilsbry, H. A. 1948. Land Mollusca of North America, north of Mexico. Academy of Natural Sciences of Philadelphia, Monographs 3(2(2)):528.

Strecker, J. K. 1935. Land and fresh-water snails of Texas. Transactions of the Texas Academy of Science 17:4-44.

Wheeler, H. E. 1949. Polygyra hippocrepis and its author, Louis Pfeiffer. Nautilus 63(2):1-9.

Some Alternative Views About Deep-Sea Mollusks from the Arctic and from Hydrothermal Vents

Arthur H. Clarke

Abstract

Some significant conclusions presented in 3 recently- published papers about deep-sea mollusks are examined and alternatives are proposed. It is suggested (1) that all species living in hydrothermal vent communities may not be unique to those communities and that at least some of them may be ecophenotypes of nearby non-vent species; (2) that perceived differences between vent and non-vent prosobranch faunas, at the ordinal level, may reflect regional phenomena, and (3) that major conclusions about the relationships and origins of the arctic abyssal fauna and about the taxonomy of several of the species, although purported to be new, actually originated with previous authors.

Introduction

Two papers have recently appeared on mollusks associated with deep-sea hydrothermal vents, and one has appeared on deep-sea arctic mollusks, each of which contain significant conclusions about which caveats are appropriate or alternative interpretations appear to be justified. These areas should be pointed out so that workers will have access to some diversity of opinion.

Acknowledgements: - I thank Ms. Jane Deisler, of the Corpus Christi Museum, and Drs. Nadina Duran and Jennifer Smith, both of Corpus Christi State University, for critical comments on this paper, and Mrs. Frances Trevino, also of CCSU, for typing the manuscript.

Mollusks At Hydrothermal Vents

In a paper dealing principally with hydrothermal vent mollusks, Lutz *et al.* (1984) consider the "basic question [of] how the species and associations [common to many widely-separated deep-sea hydrothermal vent communities in the eastern Pacific] are established and maintained in a habitat that is markedly patchy in time and space". I believe that this question is premature. We should first address the issue of how many hydrothermal vent taxa are distinct species and how many are only ecophenotypes of widespread, non-hydrothermal benthic species.

Hundreds, and perhaps even thousands, of deep-sea molluscan species are probably still unknown and recent monographic studies are inadequate to allow thorough comparisons of vent and non-vent species. It seems apparent even now, however, that some vent and non-vent species are so closely related as to suggest that they may be conspecific. For example, except for its large size, the dominant vent bivalve *Calyptogena magnifica* Boss & Turner (1980) is virtually indistinguishable from the neighboring non-vent species, *Calyptogena elongata* Dall (1916). Further, the findings by Lutz *et al.* that in some vent species the larvae are planktonic and in others they are not demonstrate, at least among the latter species, that no special strategies for larval transport have evolved in response to the apparently difficult problem of achieving vent-to-vent dispersal across many miles of cold and inhospitable hydrospace. This lack of a solution may well indicate the lack of a problem. It also supports the hypothesis that widespread reservoir populations of some of the vent taxa may occur in nearby non-thermal habitats.

Further sampling between vents and genetic comparisons of similar vent and non-vent species would seem to be highly desirable future activities. Scientific progress would also be advanced by sharing unworked deep-sea material among many other interested taxonomic specialists.

In another paper Turner (1985) makes a thoughtful comparison between non-vent and vent prosobranchs by utilizing data from studies on western Atlantic mollusks (the Gay Head, Massachusetts, to Bermuda transect presented in a graph contributed by M. Rex) and data from her studies, and that of her collaborators, on mollusks from eastern Pacific hydrothermal vents. Neogastropod species are deduced to be more abundant than archaeogastropod or mesogastropod species in non-vent abyssal communities whereas archaeogastropod species are dominant in vent communities.

Although the graph is not entirely satisfactory for such comparative purposes[1], it is in general agreement with a world-wide compilation on deep-sea mollusks (Clarke, 1962(a)). The world study cited 491 nominal species of prosobranchs represented by some 4500 abyssal records, about 95% of which are from the 1000-2000 fm (1828 - 3656m) depth interval. Among these prosobranchs, 26% are species of archaeogastropods, 24% are mesogastropods, and 50% are neogastropods. Unfortunately very few non-vent prosobranchs from the abyssal eastern Pacific have been studied at

---

(1) Non-additive linear and curvilinear functions are presented together as if they were additive, and no standard errors are given for estimates.

the genus or species level. Clearly, however, the eastern Pacific vent prosobranch faunas, which are dominated by archaeogastropods (mostly limpets), are significantly different at the ordinal level from the world-wide deep-sea prosobranch fauna when considered as a whole.

An interesting possible explanation for this anomaly has already been provided by Parker (1962) whose paper should be consulted for details. That author pointed out that an unusually large number of ancient morphological invertebrate types occurs in the abyssal borderlands close to the steep western continental slopes of the Americas. These includes Neopilina, a preponderance of archaeogastropods among the snails, many paleoconch and protobranch bivalves, primitive echinoderms (certain stalked crinoids and the asteroid family Porcellanasteridae), an archaeic order of isopods (Asellota), and Pogonophora. "It is suggested that many of the shelf and epicontinental bottom faunas migrated down the slope during the Paleozoic and early Mesozoic times in response to competition and population pressure from the newly evolved forms" (Parker, 1962:286).

Other studies (e.g. Clarke, 1962(a), 1962(b)) have provided further relevant data showing that each ocean basin so far studied has unique attributes. For example, the buccinid genera Mohnia, Buccinum, and Colus, which have speciated to a great degree in shallow arctic and subarctic seas[2] also contain about 20 abyssal species, all

---

(2) Speciation of Buccinidae in that region was perhaps mediated by population fragmentations caused by the long-term periodic subaerial exposures and subsequent inundations of Bering Strait and other shallow sills during the Pleistocene.

located in basins adjacent to those buccinid-rich shallow northern areas. Several other families and genera, which have undergone substantial adaptive radiation in particular neritic geographic regions, also have deep-sea representatives restricted to basins close to those presumed centers of primary radiation. Examples are the genera Cingula and Alvania (Family Rissoidae: arctic and boreal); the families Architectonicidae, Tonnidae, Mitridae and Volutidae (all tropical and subtropical); and the genus Tromina (Buccinidae: antarctic and subantarctic).

Archaeogastropod limpets exhibit high species diversity along the nutrient-enriched, high energy, and discontinuously rocky western coasts of the Americas. It is possible that ecological attributes especially conducive to limpet evolution and proliferation have existed on those coasts, and that numerous successive taxonomic groups of limpets have occurred there, since the Paleozoic or for even longer. It is also possible that some species from these assemblages may have migrated, during several periods in this long interval of time, across the narrow (about 50-100 km) continental shelf and slope to become established in the abyssal borderlands within which the hydrothermal vents now occur. The dominance of limpets at eastern Pacific hydrothermal vents may therefore be a regional phenomenon which will not recur elsewhere, certainly not in areas far from significant, ancient, shallow-water centers of limpet adaptive radiation.

Arctic Mollusks

Finally, I must comment on a paper by Bouchet and Warén (1979) which presents a revision of the arctic abyssal molluscan fauna. Their conclusions

about the taxonomy and zoogeography of the species are based on large assemblages of specimens and their bibliography is extensive. The observations below are designed to suppplement the information they have presented.

Students of the history of ideas should compare the major conclusions of Bouchet and Warén's paper, conclusions which are represented as original, with the exceedingly similar conclusions on the same subjects (e.g. on the origins and relationships of the arctic abyssal mollusk fauna), previously published in a series of papers by Clarke, (1962(b), 1963, 1973, and 1974). Other failures to acknowledge previously published statements which are very similar to, or identical with, other conclusions purported to be new by Bouchet and Warén, occur in regard to species of Bathyarca, Choristella, and Torellia, etc. (see e.g. Clarke, 1960:9; 1961:360; and 1974:13). (Bouchet and Warén were aware of all of these papers, as shown by their bibliography). Malacologists should also defer acceptance of the several synonymies proclaimed by Bouchet and Warén (e.g. in regard to Malletia abyssopolaris, Colus hunkinsi, and Alvania karlini) which are not supported by evidence. Recent comprehensive papers by Bernard (1979), Lubinsky (1980), Macpherson (1971), and Knudson 1979) provide some useful taxonomic alternatives.

It should also be pointed out that the extensive collection of arctic mollusks at the National Museums of Canada should be consulted in connection with future zoogeographic studies on arctic marine mollusks. Uncertainties expressed by Bouchet and Warén about published records for some naticids and cylichnids could have been resolved, and much more complete zoogeographic coverage could have been achieved, if that collection had been utilized.

Literature Cited

Bernard, F.R., 1979: Bivalve mollusks of the western Beaufort Sea. Contributions to Science, Natural History Museum of Los Angeles County, No. 313:1-80.

Boss, K.J. and R.D. Turner, 1980: The Giant White Clam from the Galapagos Rift, Calyptogena magnifica Species Novum. Malacologia, Vol. 20 (1):161-194.

Bouchet, P. & A. Warén, 1979: The abyssal molluscan fauna of the Norwegian Sea and its relation to other faunas. Sarsia 64:211-243.

Clarke, A.H., 1960: Archibenthal and abyssal mollusks from drifting Station Alpha. Brevoria, 119:1-19.

_____, 1961: Abyssal mollusks from the South Atlantic Ocean. Bulletin of the Museum of Comparative Zoology, 126(12):345-387. 4 plates.

_____, 1962(a): Annotated List and Bibliography of the Abyssal Marine Molluscs of the World. National Museums of Canada, Bulletin 181, pp. i-iv+1-114.

_____, 1962(b): On the composition, zoogeography, origin and age of the deep-sea mollusk fauna. Deep-Sea Research 9:291-306.

_____, 1963: On the origin and relationships of the Arctic Ocean abyssal mollusk fauna. XVI International Congress of Zoology, Preprints, Washington, D.C., p.202.

_____, 1973: Aspects of molluscan zoogeography in Baffin Bay and the Greenland Sea. Bulletin of the American Malacological Union, Inc., pp. 31-32.

_____, 1974: Molluscs from Baffin Bay and the northern North Atlantic Ocean. National Museums of Canada, Publications in Biological Oceanography, No. 7:i-xii+1-23.

Dall, W.H., 1916: Diagnosis of New Species (etc.). Proceedings of the United States National Museum, Vol. 52, No. 2183, 393-417.

Knudsen, J., 1979: Deep-sea bivalves. Chapter 9 (pp. 195-224) (in) Pathways in Malacology, S. v. d. Spoel, A.C. v. Bruggen, and J. Lever, editors. Utrecht: Bohn, Scheltema & Holkema.

Lubinsky, Irene, 1980: Marine Bivalve Molluscs of the Canadian Central and Eastern Arctic: Faunal Composition and Zoogeography. Canadian Bulletin of Fisheries and Aquatic Sciences. Bulletin No. 207:i-vi+1-112, 11 pls., 42 maps. Dept. of Fisheries and Oceans, Government of Canada.

Lutz, R.A., D.C. Jablonski, and R. D. Turner, 1984: Larval development and dispersal at deep-sea hydrothermal vents. Science, 226:1451-1454.

Macpherson, Elizabeth, 1971: The Marine Molluscs of Arctic Canada. Prosobranch Gastropods, Chitons and Scaphopods. National Museums of Canada. Publications in Biological Oceanography, No. 3:i-viii+149, 7 pls., 54 maps.

Parker, Robert H., 1962: Speculations on the Origin of the Invertebrate Faunas of the Lower Continental Slope. Deep-Sea Research, 8:286-293.

Turner, R.D., 1985: Notes on mollusks of deep-sea vents and reducing sediments. American Malacological Bulletin, Special Edition No. 1 23-34.

RESEARCH PARTICIPATION OPPORTUNITY

In September, 1986, ECOSEARCH, Inc. will carry out a field survey of two rare (and perhaps endangered) freshwater mussels, viz. Arcidens (Arkansia) wheeleri (Ortmann & Walker) and Lampsilis streckeri Frierson in Arkansas, Oklahoma, and Texas. Anyone wishing to participate should call A.H. Clarke (512 - 643-1689) as soon as possible. Financial support provided.

Erratum: In the preceding number of this journal, on page 22, I stated that Neves and Widlak (1986) had reported juvenile mussels buried as deep as 2 feet into the substrate. That was incorrect. In the verbal presentation of that paper (AMU, 1985) Dr. Neves referred to a water depth of 2 feet, not a substrate depth.

FORUM (1)

Potamilus Rafinesque (1818) versus *Proptera* Rafinesque (1819) (Unionidae)

Arthur H. Clarke

ABSTRACT

The type species of *Potamilus* Rafinesque (1818), by subsequent monotypy (Morrison, 1969), is *Unio alatus* Say (1817). Therefore, in agreement with the usage of some workers but for reasons not previously recognized, *Potamilus* Rafinesque (1818) must displace the more traditional name *Proptera* Rafinesque (1819).

---

(1) FORUM has been initiated to promote exchange of views on significant malacological issues. Divergencies of opinion about the nomenclature of some Unionacea comprise a collection of such issues. It seems reasonable to believe that if each case is discussed individually and thoroughly, nomenclatorial uniformity may be achieved. Other views about the issue addressed here or comments about other problems, if sent to the Editor, will be promptly published in FORUM.

INTRODUCTION

For nearly two decades there has been disagreement among specialists about whether Potamilus Rafinesque (1818) or Proptera Rafinesque (1819) should be used for a well-known genus of North American Unionidae (e.g. see Johnson, 1980). Most of the six species included therein are important members of their respective biological communities and one, Potamilus (or Proptera) capax (Green, 1832), has been included on the federal List of Endangered and Threatened Species. Details of this rather confusing case are presented below.

HISTORICAL RECORD

In 1817, in Nicholson's Encyclopedia, Thomas Say described and figured nine new species of Unio, viz. U. crassus and U. ovata from the Ohio River, U. cylindricus from the Wabash River, U. alatus from Lake Erie, and 5 species from the Atlantic Coastal Plain. All are recognizable, although the figure of U. alatus shows a poor specimen with most of the dorsal alation missing.

In 1818 C.S. Rafinesque, in a letter mailed in July from Louisville, Kentucky and published in September, presented a preliminary review of his "discoveries during [a] journey through the western states". Many new generic and specific names were introduced there for mammals, reptiles, fishes, mollusks, and plants and complete lists of all of the fishes and mollusks which he had collected were given. The list of mollusks, all of which were stated to be from the Ohio River, contains specific names for 24 unionids and 8 gastropods, "the whole of which appear to be new" (Rafinesque, 1818, p. 355). The new generic name Potamilus was

introduced, the genus was briefly described, and the 24 unionid names were included under it, all as nude names only. These names, in Rafinesque's order are: Potamilus latissimus, violacinus, niger, fasciolaris, phaiedrus, ellipticus, zonalis, obliquatus, retusus, truncatus, triqueter, alatus, leptodon, fragilis, nervosus, fasciatus, auratus, gibbosus, verrucosus, tuberculatis, nodusus, pusillus, subrotundus, and obovalis. No authors were cited in the list for any of those names but it is clear from the context that the abbreviation "Raf.", which was appended at the end of the list, meant that Rafinesque was claiming authorship for all of them.

Johnson (1975) has shown that at some point in time Say sent a separate of his 1817 paper to Rafinesque. Internal evidence in Rafinesque's 1818 paper, cited above, shows that either he had not received Say's paper in July of that year or if it had been received it had not been taken into account. Therefore the use of alatus by both Say and Rafinesque should be considered fortuitous. There are four strongly alate species in the Ohio River System(2) and it is not clear which species Rafinesque might have meant by "alatus".

In 1819 Rafinesque published, under the genus Unio, descriptions of eight new subgenera. The first of these, Proptera, was accompanied by a description and notation: "4 espèces, alata, phaiedra, pallida, etc." (all nude names). Elsewhere in the paper (p. 427; see also Binney and Tryon, 1864, p. 29) Rafinesque cited

---

(2) Currently recognized as: Lasmigona complanata (Barnes) Proptera alata (Say), Proptera laevissima (Conrad), and Leoptodea fragilis (Rafinesque).

"Alasmodon, Say". That name, as Alasmodonta, was introduced by Say (1818) as a substitute for Monodonta Say, 1817 (preoccupied). Say's (1818) paper contained an explicit reference to his 1817 paper in which he had described Unio alatus. It is therefore clear that in 1919 Rafinesque was aware of Say's publications of 1817 and 1818 but it is not clear whether the name alata, cited under Proptera by Rafinesque, was meant as a reference to Say's species or to Rafinesque's. It is perhaps significant that specimens of "Proptera" alata (Say) from Lake Erie have quite a different appearance than those from the Ohio River. It would not have been immediately obvious to Rafinesque that Say's name alatus was applicable to an Ohio River species.

In 1820 Rafinesque proposed the new genus-group name Metaptera as a substitute for Proptera which he now considered inappropriate. Of course according to the International Code of Zoological Nomenclature (Articles 18 and 23m) such emendations are invalid. He included four species under Metaptera, viz. Metaptera megaptera (as a new species with a description and a figure), "Unio alatus of Say", "Unio ochraceus Say" and "Unio cariosus Say" (all without descriptions or figures). The notation "of Say" following Unio alatus probably indicates an effort to distinguish Say's concept from his (Rafinesque's) previous one. It is possible that M. megaptera was proposed as a replacement name for Unio (Proptera) alata Rafinesque (1819), but Rafinesque did not so state. Rafinesque's action, for nomenclatorial purposes, constitutes assignment of these four available species to Proptera. Subsequently Herrmannsen (1847) designated Unio alatus Say as the type species of Metaptera Rafinesque and since Metaptera had been proposed as a substitute for Proptera, Unio alatus Say also became the type species of Proptera by subsequent designation.

Proptera Rafinesque, with U. alatus Say as its type species, was used almost universally in the primary literature from 1900 to 1969. In 1969 Morrison asserted that Potamilus Rafinesque (1818) should displace Proptera Rafinesque (1819) because although the 24 species originally included under Potamilus were all nude names, one name was recognizable, viz. alatus because it had been validly introduced by Say in 1817, and therefore Unio alatus Say was the type species of Potamilus by monotypy. It has been shown above, however, that it was Unio alatus Rafinesque, and not Unio alatus Say, which was originally included in Potamilus by Rafinesque, so Morrison's assertion was in error. Nevertheless, since 1969 both Potamilus and Proptera have been used in the literature with neither attaining preponderance over the other.

CONCLUSION

Further clarification of this case may be achieved by careful application of the International Code of Zoological Nomenclature (1985) (3). According to Article 12a the genus Potamilus Rafinesque (1818) is an available genus name even though it originally contained no available species. Although Morrison's 1969 assertion that Unio alatus Say was originally included in Potamilus and should be regarded as its type species was an error, Morrison's action

---

(3) I thank Mr. Mark Tollitt, Senior Biologist, International Commission on Zoological Nomenclature, for assistance in interpretation of the Rules in this case. Comments by Jane E. Deisler, Corpus Christi Museum, were also helpful. All errors, however, are entirely my own.

constituted a valid assignment of Unio alatus Say to Potamilus Rafinesque. Since no previous author appears to have assigned any other available species to Potamilus, Unio alatus Say becomes the type species of Potamilus by subsequent monotypy (ICZN Code, Article 69,a,ii,1).

Therefore, although resolution of the issue appears to be based on different grounds than those stated by Morrison (1969), the result is the same, and unfortunately Potamilus Rafinesque (1818) must replace the well-known name Proptera Rafinesque (1819) for the genus in question.

REFERENCES

Binney, W.T. (Editor). 1858. The Complete Writings of Thomas Say on the Conchology of the United States. H. Bailliere, New York and London.

Binney, W.G. and G.W. Tryon (Editors). 1864. The Complete Writings of Constantine Smaltz Rafinesque on Recent and Fossil Conchology. Bailliere Brothers, New York and London.

Green, Jacob 1832. Notes of a naturalist. Cabinet of Natural History and American Rural Sports, Vol. 2, pp. 290-291. J. and T. Daughty, Philadelphia.

Herrmannsen, A.N. 1847-49. Indicis Generum Malacozoorum Primordia, Vol. 2. Casselis, London.

International Commission on Zoological Nomenclature. 1985. International Code of Zoological Nomenclature, Third Edition. i-xx+1-338. London: British Museum (Natural History).

Johnson, R.I. 1974. First Paper on the Conchology of the United States by an American Author, Thomas Say, 1817. Journal of the Society for Bibliography of Natural History, Vol. 7, pp. 265-267.

Johnson, R.I. 1980. Zoogeography of North American Unionacea (Mollusca: Bivalvia) North of the Maximum Pleistocene Glaciation. Bulletin of the Museum of Comparative Zoology, Vol. 149, No. 2, pp. 77-189.

Morrison, J.P.E. 1969. The Earliest Names for North American Naiades. Annual Reports for 1969, American Malacological Union, pp. 22-24.

Rafinesque, C.S. 1818. Discoveries in Natural History, Made During a Journey through the Western Region of the United States. American Monthly Magazine and Critical Review, Vol. 3 (Sept., 1818), pp. 354-356. (Section entitled "Conchology or the shells", (p. 355 of original) reprinted in Binney and Tryon, 1864: 22-23). (Original seen).

Rafinesque, C.S. 1819. Prodrome de 70 Nouveaux Genres d'Animaux Découverts dans l'Intérieur des Etats-Unis d'Amérique, durant l'Année 1818. Journal of Physique, de Chimie, d'Histoire Naturelle. [etc]., Vol 88 (VI Classe, Mollusques), pp. 423-428. (Reprinted in Binney and Tryon, 1864:25-31). (Reprint only seen).

Rafinesque, C.S. 1820. Monographie des Coquilles Bivalves Fluviatiles de la Riviere Ohio, Contenent Douze Genres et Soixante-Huit Especes. Annales Generales des Sciences Physiques, Bruxelles, Vol. 5, No. 13, pp. 287-326. (Reprinted in Binney and Tryon, 1864:34-64). (Reprint only seen).

Say, Thomas. 1817. Article entitled "Conchology" [in] First American Edition of the British Encyclopedia or Dictionary of Arts and Sciences etc. by William Nicholson, Vol. 2 (B-E); 14 pages (unnumbered), 3 plates (numbered). (The Binney, 1858, reprint of Say's writings contains only the third edition of this paper, an edition which differs in some important details from the first edition). (Original seen).

Say, Thomas. 1818. Description of a New Genus of Fresh Water Bivalve Shells. Journal of the Academy of Natural Sciences of Philadelphia, Vol. 1, pp. 459-460. (Reprinted in Binney, 1858:62-63). (Original seen).

BOOK REVIEW

SEASHELLS OF BRAZIL by E. C. Rios. 1986. 328 pp., 102 pls. (1421 illus.). Museu Oceanographico, Rio Grande, Brazil. Softcover, 8 X 11". U.S. $25.00.

Brazil, the largest country in the Americas, has one of the most diversified and interesting marine faunas. Its long shores are influenced by four major zoogeographical regions---the colorful, tropical Caribbean province to the north; the temperate, cool Argentinian and Uruguayan influence in the south; the highly endemic Pernambuco subprovince; and the occasional invasion of transatlantic species coming from West Africa.

Dr. Eliezer Rios, Director of the Museum of Oceanography in Rio Grande, has met the challenging and massive array of over 1400 Brazilian marine mollusks by now producing a huge new tome with superior photographs of all species, and accompanied by English descriptions and detailed locality and habitudinal records. There are illustrations of 1000 gastropods, 30 scaphopods, 360 bivalves and 26 species of cephalopods. This book picks up where American Seashells leaves off. It is not only a

thorough coverage of the Brazilian marine mollusks, but is also is a guide to many of the common shells of the Caribbean and Uruguay.

The book is easy to use, with each of the species properly assigned to order, family, genus and subgenus, and with a convenient reference number which allows the user to find quickly the proper illustration among the 102 plates of black-and-white photographs. Authors, dates and synonymies are given for each species, and there is a large bibliography of 800 references to scientific papers dealing with South American marine mollusks---perhaps the largest ever offered to the public. The index has 4,000 scientific names alone. We are spared the indignity of any new species being proposed in this book.

Despite the brief title, this book will be a useful reference tool and a much-consulted illustrated guide to the shores stretching from the islands of the West Indies to the beaches of northern Argentina. No recent book for its modest price has so much to offer. - - - R. Tucker Abbott.

BOOK REVIEW

SEASHELL TREASURES OF THE CARIBBEAN by Lesley Sutty. Edited by R. Tucker Abbott. E. P. Dutton, New York. 1986. 128 pp., 139 color plates. $19.95. (with autographed, numbered bookplate $21.95 (from American Malacologists, P.O. Box 1192, Burlington, MA 01803).

The author, an accomplished naturalist, diver and photographer, has chosen 100 species of Caribbean mollusks "to illustrate and comment upon so that the reader may share my enthusiasm and joys in discovering the shells of these beautiful tropical islands." She has attempted to inspire others to study mollusks by relating her experiences in seeking these elusive and fascinating animals in the Lesser Antilles. Her lively and engaging narrative, coupled with her

stunning photographs, are certain to provide any shell lover with many hours of pleasurable reading, and should stimulate interest in seeking and observing marine shells.

A preface by the editor and the author's introduction begin this volume, followed by chapters entitled, "What is a Rare Shell?", "Strange and Beautiful Shapes", "Treasures of Sea and Reef", and "Science in Shells." Rare shells discussed and illustrated include Cypraea surinamensis, Pterynotus phyllopterus and Conus granulatus, to name just a few. Unusual mollusks, such as Umbraculum umbraculum, Glossodoris clenchi and Xenophora conchyliophora become familiar through the author's animated writing style. The bulk of the species are treated in the "Treasures" chapter where we meet the rediscovery of Hexaplex straussi and such desirable species as Lyria archeri, Conus cedonulli and Chlamys multisquamata. An abbreviated history of Caribbean malacology, followed by a brief bibliography, index and glossary of terms, completes the text.

There is a great deal of merit in this beautifully illustrated book, and it is important again to stress that the author has fully achieved her aim of sharing with others her collecting activities. This book is not intended to be an identification guide. Despite meticulous editing, last minute publisher's errors do creep in, such as the transposition of the captions for plates 22 and 23, and the indiscriminate use of parentheses around every author and date. Nonetheless, it is hoped that this well-produced and lavishly illustrated work will be enjoyed and appreciated by nature lovers and conchologists, and will serve to introduce living mollusks to many new enthusiasts.---Walter E. Sage.

AMERICAN MALACOLOGISTS EXPANDS AND SHEDS THE NAUTILUS

Dr. R. Tucker Abbott's book publishing firm, American Malacologists, has expanded by opening a New England Division in Burlington, Mass. where all future sales will be handled. This will give Dr. Abbott an opportunity to concentrate on research and writing new books. His daughter, Cynthia Abbott, will fulfill orders for such books as the Compendium of Seashells, and such new books as Seashell Treasures of the Caribbean by Sutty, the mammoth new Seashells of Brazil by Rios, and Bratcher and Cernohorsky's Living Terebras of the World and the Register of American Malacologists. Book dealers should now contact American Malacologists, P.O. Box 1192, Burlington, MA 01803.

E. J. Brill, a 350-year-old Dutch publishing company has recently acquired the back stock and rights to The Standard Catalog of Shells and Monographs of Marine Mollusca, but Dr. Abbott will continue as editor of both. Bob Wagner will continue as editor of the World Size Records. Brill has placed the North American distribution rights to S. Peter Dance's new History of Shell Collecting in the hands of American Malacologists.

The 100-year-old journal, The Nautilus, which was edited by Dr. Abbott for 28 years, has been transferred to the non-profit Trophon Corporation of Maryland and will be edited by Dr. M. G. "Jerry" Harasewych of the Smithsonian Institution. Dr. Abbott will continue to serve as a consulting Associate Editor. Subscriptions and manuscripts should be sent to The Nautilus, P.O. Box 3430, Silver Spring, MD 20901-0340. Back volumes will be available from Dr. W. Backhuys, P.O. Box 9000, 2300 PA Leiden, The Netherlands.

INFORMATION FOR CONTRIBUTORS

Malacology Data Net (Ecosearch Series) seeks to enhance progress in malacology by facilitating rapid publication of significant new information about all aspects of marine, freshwater, and terrestrial mollusks. All scholarly contributions are welcome, but manuscripts dealing with timely issues such as current threats to the survival of molluscan species or communities, descriptions of new taxa, opportunities for participation in ongoing research programs, etc. are particularly appropriate. Letters to the Editor about concerns of general interest, such as nomenclatorial stability, new curatorial methods, unusual finds of rare species and other matters are also welcome.

Editorial style used in this journal follows the Style Manual for Biological Journals available from the American Institute of Biological Sciences, 1401 Wilson Boulevard, Arlington, VA 22209. Manuscripts should be submitted as camera ready copy, in duplicate, and text should be typed in blocks 5 inches wide and 6 1/2 inches high. Use of a word processor, if available, is recommended. Each manuscript will be reviewed by the Editor and by two other professional malacologists and, if necessary, will be returned to the author for revision. A reprint order form will accompany notification of acceptance and publication of most manuscripts will ensue within 8 weeks. "Data Net" is a new journal without grant support, so authors are asked to remit page charges of $10.00 per page, if possible, and to pay preparation and reproduction charges for plates at cost. Advertising rates are available on request. Letters to the Editor will be published without charge.

Malacology Data Net (Ecosearch Series) is published by ECOSEARCH, Inc., 325 E. Bayview, Portland, Texas 78374.