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BIOMPHALARIA STRAMINEA AND OTHER PLANORBIDS IN THE DOMINICAN REPUBLIC

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In addition to previous records of Biomphalaria glabrata *in the Dominican Republic, the southern central communities of Haina Arriba and Boca Chica, in the National District, are reported as new localities for that species; other species collected were* Biomphalaria obstructa, B. helophila, Drepanotrema lucidum *and* Lymnaea viatrix.

Biomphalaria straminea, *a potential vector of* Schistosoma mansoni, *was found for the first time in the country, in the River Iguamo, just outside of the community of San Pedro de Macorís.*

Key words: Planorbidae – *Biomphalaria straminea* – Dominican Republic

In March of 1981, during a collecting trip to the island of Hispaniola, we had the opportunity to search for freshwater snails in the Dominican Republic. The primary objective of this search was the identification and localization of potential intermediate hosts for *Schistosoma mansoni.*

Biomphalaria glabrata (Say, 1818) had been identified as the only principal intermediate host for *S. mansoni* present in the Dominican Republic. It was collected from two streams (Las Guamas and Paña Paña) near the town of Hato Mayor by Ponce Pinedo (1947), and then by Olivier, Vaughn & Hendricks (1952), who also found a few specimens in the arroyo Maguá near the mouth of the Paña Paña and in the arroyo Jagua. Coutinho (1952) found it in the arroyo Paña Paña, in a pond at the village of Las Palmillas, 4 km to the northeast of Hato Mayor, and in another pond on the road to El Seibo, about 200 m from the Paña Paña. *B. glabrata* was also collected by Etges & Maldonado (1969), besides the Paña Paña and other sections of the Maguá drainage system, from irrigation canals and rice-fields surrounding the town of Cotuí in the central valley, and from streams, irrigation canals and swamps in or near the towns of Nisibón, Miches and Nagua, all on the Atlantic coastal (northeastern) face of the island. Vargas & Gómez (1976) reported additional foci of *B. glabrata* in Sabana de la Mar in El Seibo province, Higüey in La Altagracia province, Ramón Santana in San Pedro de Macorís province, Laguna de Guerra in the National District, Zoological Gardens in Santo Domingo, and Casa de Alto and Pimentel in Duarte Province. The parasite was first reported in the Dominican Republic by Ponce Pinedo in 1945. Subsequent studies have confirmed the region of Hato Mayor as the primary focus of infection.

RESULTS

We have identified the occurrence of *B. glabrata* in the Caribbean (southern) coastal communities of Haina and Boca Chica. In addition to *B. glabrata,* we collected *Biomphalaria obstructa* (Morelet, 1849), *Biomphalaria helophila* (Orbigny, 1835), *Drepanotrema lucidum* (Pfeiffer, 1839) and *Lymnaea viatrix* Orbigny, 1835. In the River Iguamo just outside of the community of San Pedro de Macorís, we collected specimens of *Biomphalaria straminea* (Dunker, 1848).

The sample of *Biomphalaria straminea* consisted of six specimens. The shell illustrated (Fig. 1) shows the following characteristics: diameter 7 mm, width 2.5 mm; 4.5 whorls growing rapidly, rounded, slightly subangular on the left; right side funnel-shaped, left side very shallowly

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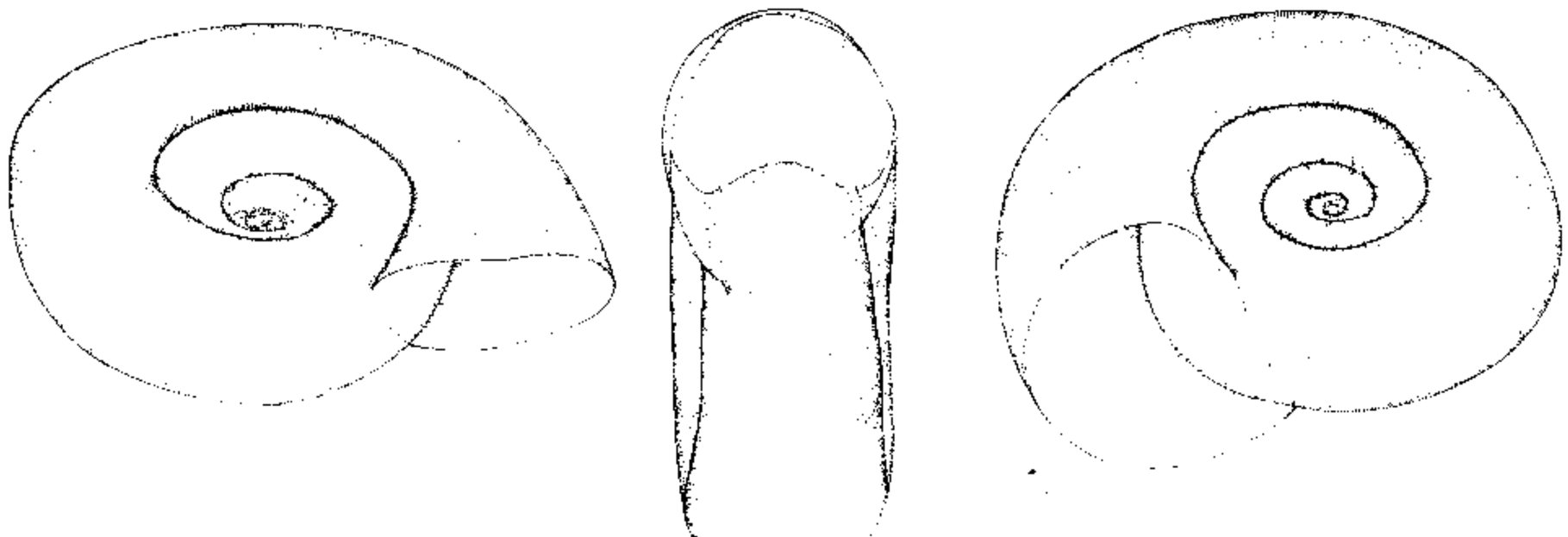
depressed; inner whorl more plainly visible on the left side, where it is more superficial, and deep sunken and partly overlapped by the next whorl on the right side; suture well marked on both sides; periphery rounded and slightly shifted to the right; aperture rounded.



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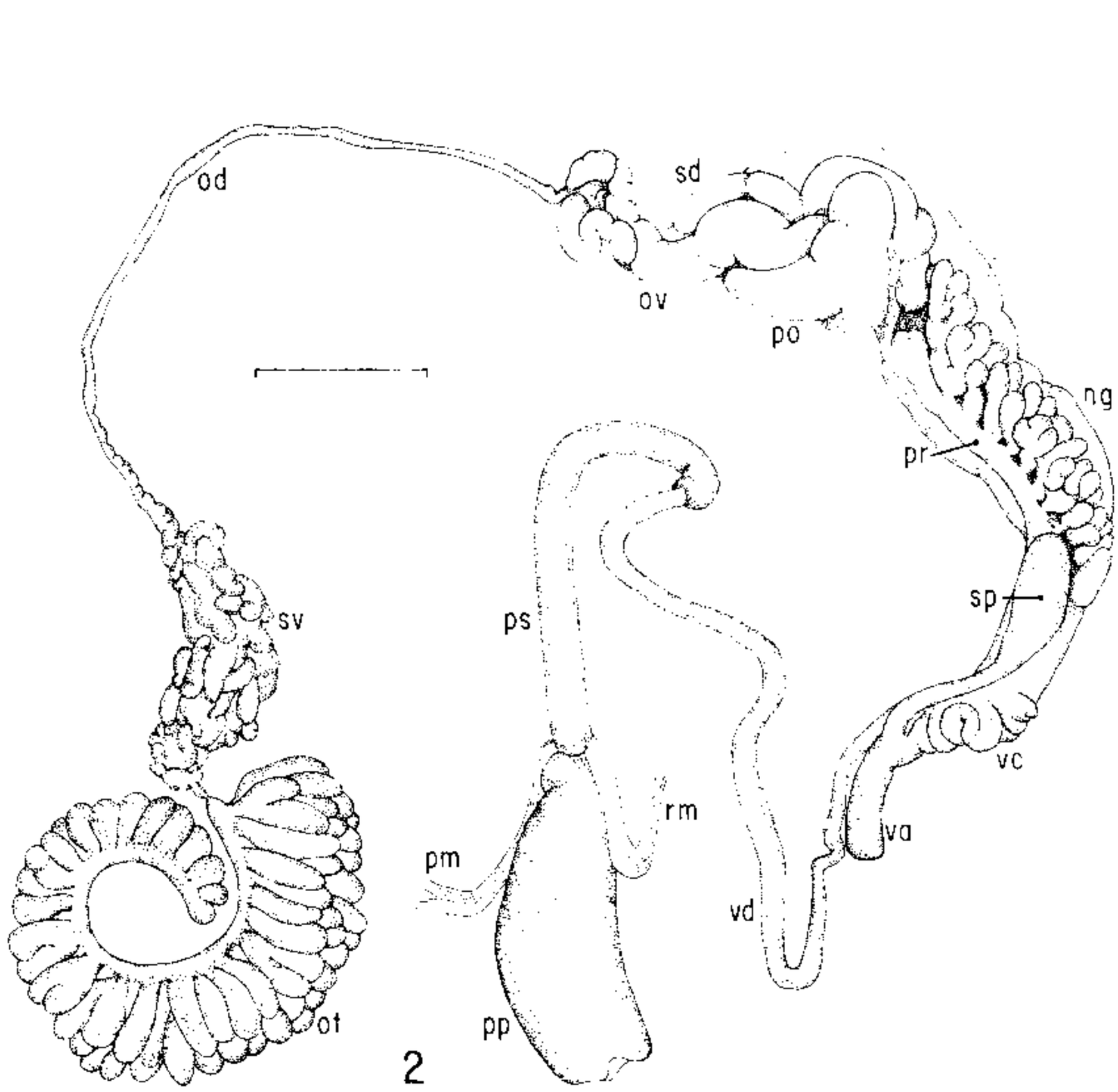

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Biomphalaria straminea **from San Pedro de Macorís, Dominican Republic – Fig. 1: shell. Fig. 2:** reproductive system (ng = nidamental gland, od = ovispermiduct, ot = ovotestis, ov = oviduct, pm = protractor muscle of penial complex, po = pouch of oviduct, pp = prepuce, pr = prostate, ps = penial sheath, rm = retractor muscle of penial complex, sd = spermiduct, sp = spermatheca, sv = seminal vesicle, va = vagina, vc = vaginal corrugation, vd = vas deferens). Bar = 1 mm.

The reproductive system (Fig. 2) answers to the description of *B. straminea* given by Paraense (1975b): ovotestis diverticula (ot) about 84 (67 simple, 13 bifurcate, 3 trifurcate, 1 quadrifid); seminal vesicle (sv) with well-developed, finger-like diverticula; vaginal wall conspicuously corrugated on the dorsal surface (vc); spermatheca (sp) with a duct about as long as the spermathecal body; prostate (pr) with 10 diverticula, most of which are divided into two main branches with secondary divisions better visible on the under surface; foremost prostatic diverti-

cula partly inserted between the spermathecal body and the nidamental gland (ng); penial sheath (ps) about one and a half times as long as the prepuce (pp) and, at its middle portion, somewhat wider than the widest portion of the vas deferens (vd). Microscopical examination of the penis showed the presence of three muscle layers, characteristic of *B. straminea*, as described by Paraense & Deslandes (1955).

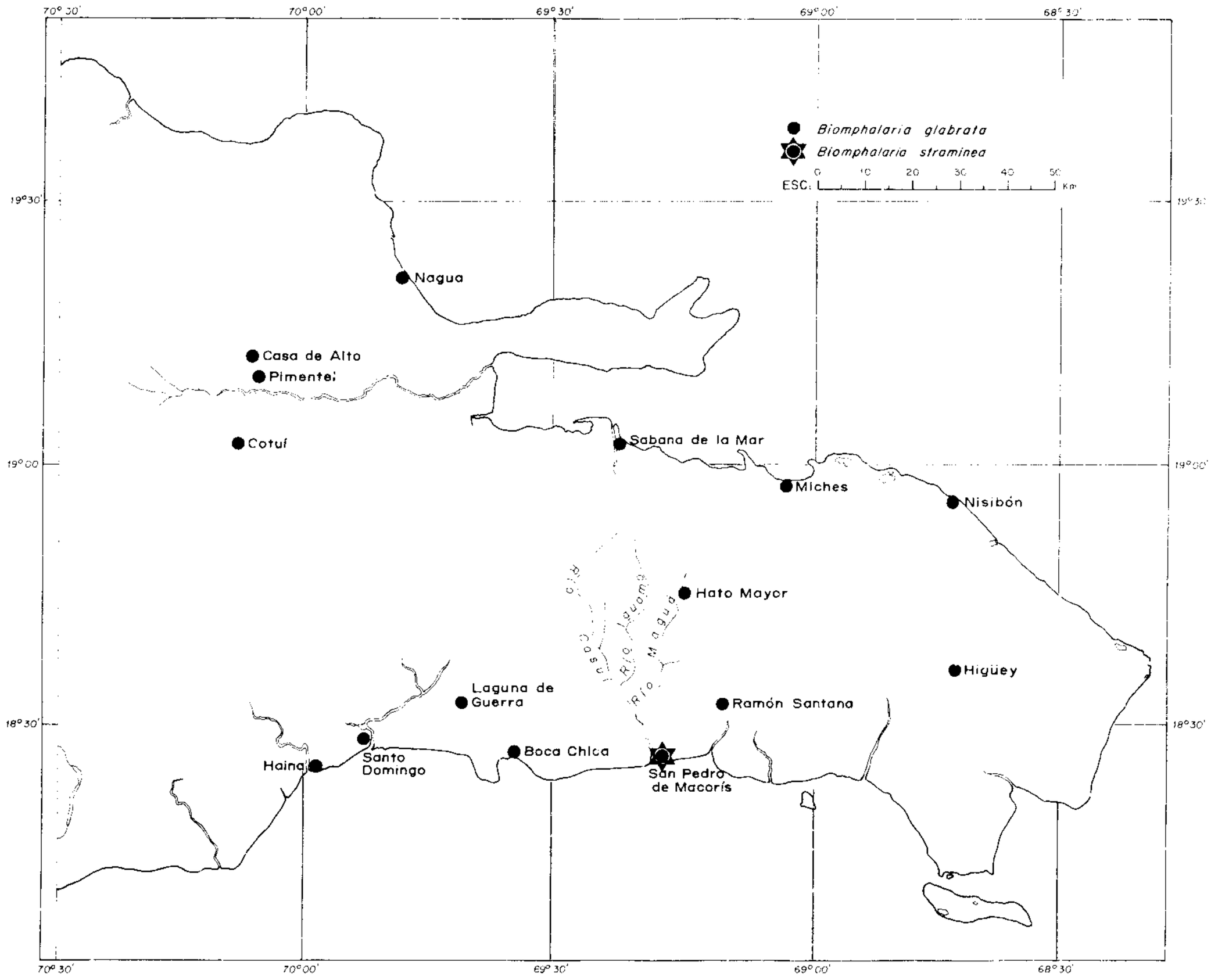

Fig. 3: eastern part of Dominican Republic, showing the localities with *Biomphalaria glabrata* and *B. straminea* mentioned in this paper.

DISCUSSION

Each subsequent field survey in the Dominican Republic has extended the known range of *B. glabrata*. It is not clear whether this represents simply identification of previously unreported sites or whether in fact the snail is gradually enlarging its range. The recent report of *B. glabrata* from the north coast side of Haiti (Robart, Mandahl-Barth & Ripert, 1976) does seem represent extension of the snail range into a new environment rather than simply the new discovery of long-standing sites. Extension may be a feature in the Dominican Republic as well. While we have no evidence that transmission of *S. mansoni* has extended beyond the well established foci, certainly the population at risk is now much larger.

The identification of *B. straminea* in the Dominican Republic is of potential importance to the study of schistosomiasis on this island.

B. straminea is the most wide-spread of the three intermediate hosts of *S. mansoni* in the Western Hemisphere. Its range extends from Costa Rica (Paraense, Zeledón & Rojas, 1981) to Argentina, east of the Andes (Paraense, 1975a). Outside the Continent it has been found at Trinidad and Martinique (Paraense, 1970). It has been incriminated as an actual vector only in a continuous area of northeastern Brazil and in four widely separate localities in that country: Fordlândia, Pará state (Machado & Martins, 1951, as *Tropicorbis paparyensis*), Goiânia, Goiás state (Cunha Neto, 1967), Picos, Piauí state (Figueiredo, Correia-Lima & Alencar, 1978), and Cruzeiro, São Paulo state (Santos et al., 1980).

With the present record the northern limit of the range of *B. straminea* is extended from about 10°N latitude (Coris, Costa Rica) to about 18°N (San Pedro de Macorís, Dominican Republic).

RESUMO

Em aditamento a registros anteriores da *Biomphalaria glabrata* na República Dominicana, são mencionadas como localidades novas para essa espécie Haina Arriba e Boca Chica, no Distrito Nacional, onde também foram coletadas as espécies *Biomphalaria obstructa, B. helophila, Drepanotrema lucidum* e *Lymnaea viatrix*.

A *Biomphalaria straminea*, vetora potencial do *Schistosoma mansoni*, foi encontrada pela primeira vez no país, no rio Iguamo, na proximidade da comunidade de San Pedro de Macorís.

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