

## On the relations of some freshwater Mollusca of the Balkan Peninsula and Asia Minor

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In May-June 1969 I travelled to Turkey in order to collect gastropods. I was especially interested in pyrguloid forms, since a great number of representatives of this group live on the Balkan Peninsula, particularly in Lake Ohrid. Among others, I collected specimens of *Pyrgula pfeiferi* Weber, 1927, *Chilopyrgula zilchi* Schütt, 1964, and *Xestopyrgula pfeiferi beysebirana* Schütt, 1965.

### *Pyrgula pfeiferi* Weber, 1927

Weber's description of the shell of this species (fig. 1) is quite satisfactory. Including it in the genus *Pyrgula* Cristofori & Jan, 1832, Weber connected this species with *P. annulata* Cristofori & Jan, 1832, from Lake Garda (Italy) and from some fresh waters of the Yugoslav coastal region. This author also considered this form to be related to *Diana thiesseana* (Kobelt, 1878) from certain Greek lakes (Weber 1927: 314, "Die Art ist ein Gegenstück zu *Pyrgula* (*Diana thiesseana*)"). On the other hand, Polinski (1932) and Schütt (1965) considered *P. pfeiferi* to be related to *P. dybowskii* Polinski, 1932, from Lake Ohrid, and the two, together with *P. barroisi* Dautzenberg, 1894, were classified in the subgenus *Xestopyrgula* Polinski, 1932.

Anatomical investigations, however, do not justify these conclusions. *P. pfeiferi* is conchologically (fig. 1A) and anatomically (fig. 3A) conspicuously different from *P. annulata* (fig. 1D and 3B) and *Diana thiesseana* (fig. 1E and 3C), and from *Xestopyrgula dybowskii* as well (cf.

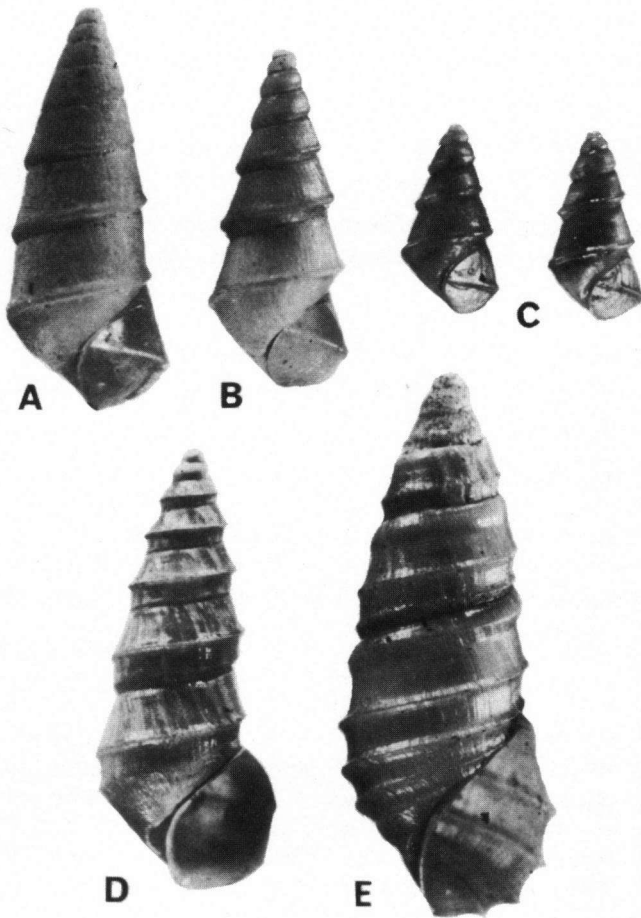


Fig. 1. *Falsipyrgula pfeiferi* (Weber) (A), *Falsipyrgula beysebirana* (Schütt) (B), *Falsipyrgula barroisi* (Dautzenberg) (C), *Pyrgula annulata* (Cristofori & Jan) (Lake Garda) (D) and *Diana thiesseana* (Godet) (E); all highly enlarged.

Radoman, 1955). Therefore I consider *P. pfeiferi* to represent a separate genus to be diagnosed as follows:

### *Falsipyrgula* nov. gen.

Shell conical, elongated, with a pointed apex; whorls rather flattened, aperture ovate; exterior keel above the shallow suture, an interior one below the suture; central tooth of radula without basal cusps; stomach with characteristic caecal tube-shaped outgrowth on the anterior, oesophageal end; penis simple; adjoining part of female reproductive system with relatively well developed seminal receptacle near tube of genital chamber; terminal part of oviduct widened, in the form of a clew-shaped loop, with particular dilatation also functioning as a seminal receptacle.

*Pyrgula pfeiferi* Weber, 1927, *typus generis*, Egerdir Gölü, Turkey.

The main anatomical difference between the genera *Falsipyrgula* on the one hand, and *Pyrgula*, *Diana* Clessin, 1878, and *Xestopyrgula* on the other is the presence of a seminal receptacle (fig. 3A,  $rs_1$ ) near the outlet of the bursa copulatrix tube in *Falsipyrgula*, which is absent in the other three genera.

### *Falsipyrgula beysehirana* (Schütt, 1965)

*Xestopyrgula pfeiferi beysehirana* Schütt, 1965

Shell (fig. 1B) tower-shaped and conical, elongated and pointed, rather solid, pale, with seven slowly and regularly increasing whorls, the first two to three whorls being slightly convex and the others almost straight in outline; suture shallow; umbilicus closed or (very rarely) barely slit-like; strong exterior keel above the suture, running along the periphery of the last whorl, very conspicuous interior keel below the suture; aperture ovate, narrowed towards the apex; end of keel on outer lip shown as little protuberance; columellar lip with upper end fused to last whorl; outer lip with irregular outline, slightly protruding.

Type locality: Kireli (or Beysehir) Gölü (lake), Turkey.

*F. pfeiferi* and *F. beysehirana*, although anatomically quite similar, conspicuously differ in the shell. *F. pfeiferi* is a little larger and comparatively broader than *F. beysehirana*, which is more slender and has a narrower base. The first species also has less prominent keels (exterior and interior) and its exterior keel is running nearer the suture than in *F. beysehirana*. *F. pfeiferi* has a comparatively longer aperture, of which the apex is situated nearer the keel than in *F. beysehirana*.

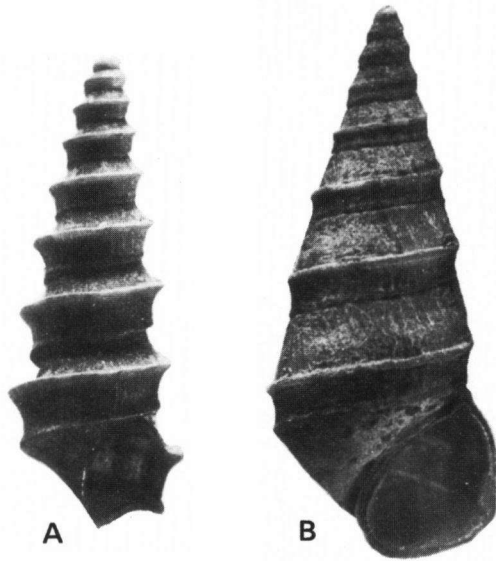


Fig. 2. *Pyrgorientalia zilchi* (Schütt) (A) and *Chilopyrgula sturanyi* Brusina (B).

*Falsipyrgula barroisi* (Dautzenberg, 1894) (fig. 1C)

*Pyrgula barroisi* Dautzenberg, 1894

Unfortunately I have at my disposal only empty shells of this species characterized by a small shell (shell nearly half the size of that of *F. pfeiferi*) from Lake Tiberias (Israel). On the basis of marked conchological similarity of this and the other two species from the Turkish lakes, I suppose that the Tiberias form belongs to the same genus. However, anatomical data are needed for confirmation.

*Chilopyrgula zilchi* Schütt, 1964

This species (fig. 2A) was discovered and described by Dr. Hartwig Schütt, who was so kind as to send me some specimens, unfortunately not quite properly fixed for anatomical examination. During my stay in

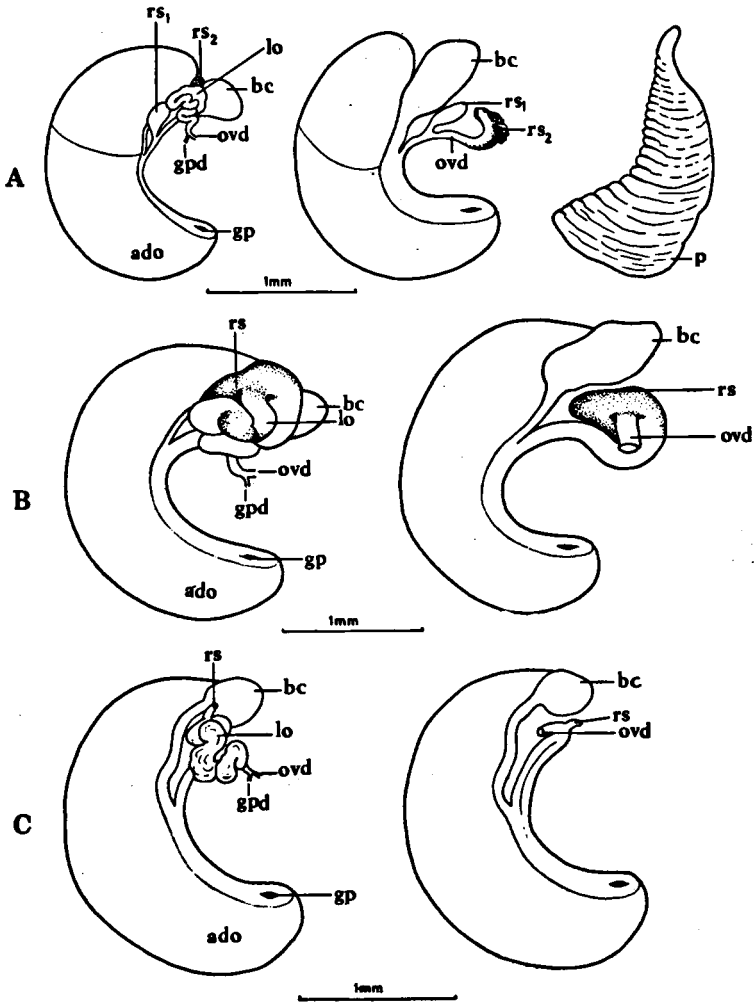


Fig. 3. Female reproductive system (without ovarium, left figures: natural position, right figures: dissected) of *Falsipyrghula pfeiferi* (A), *Pyrghula annulata* (B) and *Diana thiesseana* (C); ado – accessory gland of oviduct, bc – genital chamber (bursa copulatrix), gp – genital pore (gonoporus), gpd – gono-pericardial duct, lo – loop of oviduct, ovd – ovarian tube (oviduct), rs<sub>1</sub> – seminal receptacle<sub>1</sub> (receptaculum seminis<sub>1</sub>), rs<sub>2</sub> – seminal receptacle<sub>2</sub>; *Falsipyrghula pfeiferi*, p – penis (A, extreme right).

Turkey I was able to collect numerous specimens from the spring system of Kirkgöz.

As regards the nervous system and the stomach, this very interesting form resembles representatives of the genera *Pyrgula* and *Chilopyrgula* Brusina, 1896, but it shows significant anatomical differences from all anatomically investigated pyrguloid forms. All known forms (including *Chilopyrgula*, fig. 4B, and *Diana*, fig. 4C) have the central tooth (rhachis) of the radula without basal cusps, while this tooth in *Ch. zilchi* (fig. 4D) is equipped with two basal cusps at both sides. Great differences also exist in the structure of the female reproductive

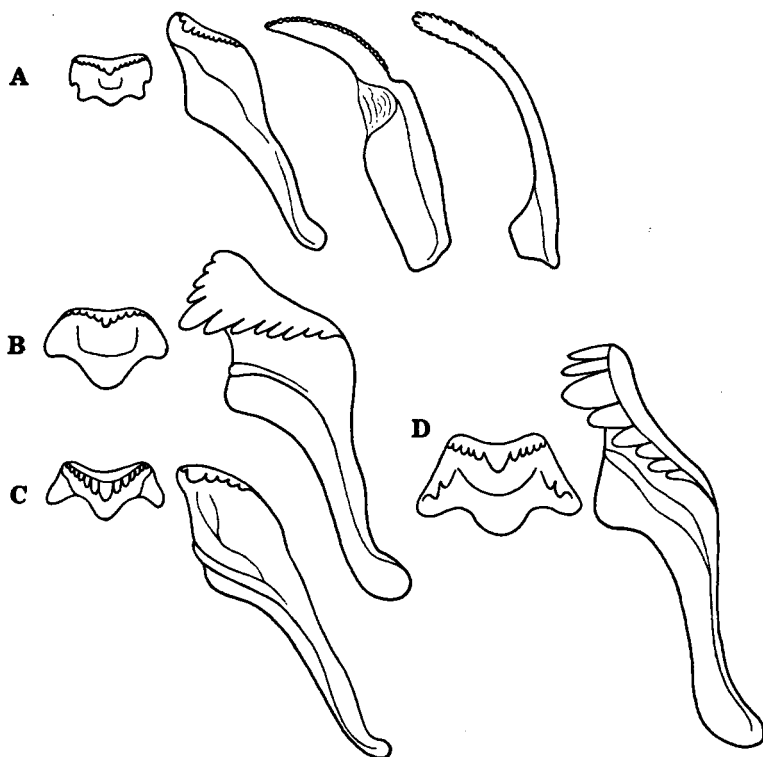


Fig. 4. Radulae of *Falsipyrgula pfeiferi* (A, four teeth), *Chilopyrgula sturanyi* (B), *Diana thiesseana* (C), and *Pyrgorientalia zilchi* (D), only central and first lateral tooth.

system. In pyrguloid forms (fig. 5A) a dilated terminal part of the oviduct serves as receptaculum seminis, while in *Cb. zilchi* (fig. 5B) two proper seminal receptacles are present: the first one ( $rs_1$ ) is well developed and debouches into the oviduct near the bursa copulatrix tube (as in *Hydrobia* Hartmann, 1821) and the second one ( $rs_2$ ), relatively poorly developed, is situated on the loop of the oviduct (as in *Orientalia* Radoman, 1972).

On the strength of these data I now propose to erect a separate genus for *Cb. zilchi*.

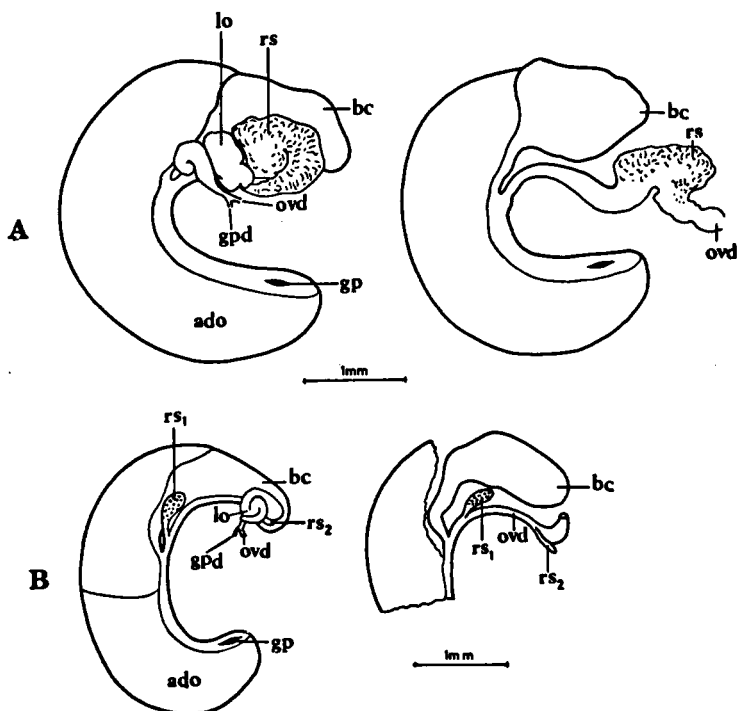


Fig. 5. Female reproductive system (without ovarium, left figures: natural position, right figures: dissected) of *Chilopyrgula sturanyi* (A) and *Pyrgorientalia zilchi* (B) (abbreviations as in fig. 3).

**Pyrgorientalia nov. gen.**

Diagnosis: see above.

*Chilopyrgula zilchi* Schütt, 1964, typus generis, from Kirkgöz spring system, about 30 km N of Antalya, Turkey (I did not find this species in Pinar-Basa, or Bunar-Basa, the strongest source providing the Kirkgöz system with water).

On the basis of the characters of the above forms from Asia Minor and the pyrguloids from the Balkan Peninsula (compare also Radoman, 1955) one may conclude that the Balkan forms represent a separate group. A more detailed work, now in preparation, will give a fuller account of that subject.

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