

## On the taxonomic status of *Deroceras caruanae* (POLLONERA 1891)

(Gastropoda: Pulmonata: Agriolimacidae).

By

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**Abstract:** The original descriptions of *Deroceras caruanae*, *panormitanum* and *pollonerae* are studied and compared with one another. There seems to be no evidence to consider *D. caruanae* as a junior synonym of *D. panormitanum* and/or of *D. pollonerae*. Therefore the authors propose to maintain a valid specific status for all three taxa, pending the availability of topotypic material.

### Introduction.

In recent literature *Deroceras caruanae* (POLLONERA 1891) is increasingly considered as a synonym of *Deroceras panormitanum* (LESSONA & POLLONERA 1882) and/or of *Deroceras pollonerae* (SIMROTH 1889). However the motive for this point of view is not clear to us. As far as we know the problem has not been fully discussed in literature. As we could not trace the type-material of the three above-mentioned taxa, we thoroughly examined their original descriptions in order to summarize and evaluate the essential characteristics.



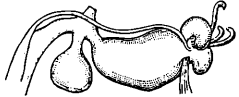
### Comparison of the original descriptions.

From the original descriptions it appears that the genitalia as well as the habitus and the colour of the slugs are of critical taxonomic importance. We present these and other characteristics in the table below, in order to facilitate their objective comparison.

After each quotation (Italian, Latin or German) a translation into English is added.

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	<i>D.</i>	<i>D. polloneræ</i>	<i>D. caruanae</i>
Type-locality	Palermo, Sicily	Palermo, Sicily	Valletta (vicinity of Porta Reale), Malta
Length	3 cm (in alcohol)	1.5 cm (preserved)	2.5 cm (extended)
Colour	"Colore brunneo-olivaceo, clypeo subnigriscente unicolore." "senza nessuna traccia di macchie o di fascie anche rudimentali tanto sul dorso quanto sul cappuccio;..." Brownish olive; mantle unicoloured almost black; no pattern of flecks nor bands	"Oben gelblich grau, mit einem schwachen Stich ins Rötliche, oben mässig gedunkelt, der Mantel unregelmässig wolzig." Yellowish grey above, with a faint tendency to red; moderately darkened above, mantle with irregular faint flecks	"..., fusco rufescente unicolore,..." ; clypeo pallide brunneo, rare et minutissime fusco-punctulato;..." Uniform dark reddish, mantle pale brown with scarce minute dark spots
Mantle	"...; clypeo magno, non gibboso, postice angulato,..." Large, not gibbous, angulated behind ; apertura pulmon. postica, pallida marginata;..." Margin of respiratory orifice pale	Not mentioned	"...; clypeo magno, elongato, grosse rugoso, ..." Large, elongated and strikingly furrowed "..., la lunghezza del cappuccio uguale se non superiore a quella del dorso, ..." Mantle as long as or longer than the tail
Tail	"..., valide brevicarinatus, carina postice abrupte-subtruncata;..." Keel short and subtruncated	hinten stumpf gebielt" Posteriorly a blunt keel	"..., brevicarinato, carina nigricante;..." Keel short and blackish
Sole	"... solea zonis lateralibus validissime transverse sulcatis." " <i>Solea pallida</i> unicolore." Tripartite..., uniform pale	"Die Sohle etwas heller, das Mittelfeld hell, die Seiten gleichmässig hell rötlich-grau." Lighter in colour than the dorsum; tripartite, central zone light, lateral zones uniform bright reddish-grey	<i>solea alba</i> unicolore;..." Uniform white
Genitalia	"... verga munita di appendici flagelliformi; ma queste non sono appiattite e lobate come nell' <i>agrestis</i> , ma lunghe, rotonde, grosso alla loro base ed alquanto attenuate in punta. Esse sono cinque quattro più piccole unite insieme alla loro base, ed una più grossa un po' distaccata dalle altre." Penis with 5 long, flagelliform appendages not inconspicuous nor lobate as those of <i>D. agreste</i> *): 4 small ones fused at their bases, and one larger one slightly separated from the others	"Der Penis gross, vorn weit mit wohlentwickeltem Reizkörper, ein oberer Teil mit der verzweigten Drüse des <i>agrestis</i> , daneben mit zwei blinden Ausstülpungen, einer weiteren, kurzen, dünnwandigen drüsigen unteren und einer langen, schmalen, umgebogenen oberen, gleichfalls dünnwandig." Penis large, with well-developed stimulator; at its free end a ramified gland similar to that of <i>D. agreste</i> *); besides that two other, thin-walled appendages: the lower one short and glandular, the upper one long, narrow and bent	"..., il sacco della verga turgido e grosso, ma alla sua estremità superiore vi sono due protuberanze grosse, allungate, arrotondate e ricurve, tra la base delle quali s'innalzano tre o quattro appendici flagelliformi sottili, lisce, di diversa lunghezza ed indipendenti tra loro fin dalla base." Penis large and swollen; with two large, elongated, rounded and curved protuberances; and between their bases with 3-4 small, flagelliform appendages which are smooth, different in length and independent from one another (not fused)
Original drawings			

\* ) *D. agreste* sensu auct. *D. reticulatum* (MÜLLER, 1774) | non *D. agreste* (LINNAEUS, 1758) |

In addition to the tabulated data, some other characteristics can be considered. In the description of *D. panormitanum*, LESSONA & POLLONERA (1882: 52) mentioned a laterally strongly compressed tail. SIMROTH (1889: 179) stated that the interior of *pollonerae* is faintly coloured, the "mesenterium" almost pale, the retractors dark brown to blackish, and the hermaphroditic gland brown, situated just behind the stomach. Finally, POLLONERA (1891: 3) reported a transparent and watery mucus for *D. caruanae*.

### Discussion.

Because the proximal parts of the genitalia of all three species were originally described and figured, our discussion will especially focus on the correct interpretation of these parts. We have to keep in mind that there exists a large number of Mediterranean species of *Deroceas*, presenting a wide diversity of penial appendages. Sometimes, among different species, the differences in their penial appendages are delicate. Therefore a careful examination of the original illustrations and descriptions of *D. panormitanum*, *pollonerae* and *caruanae* is necessary. As the drawings of the genitalia do not suggest any extreme contraction, it seems that the type-specimens were rather well preserved. This makes a comparative evaluation of their characteristics easier.

*D. panormitanum* differs from *caruanae* in being much larger, in having a brown-olive colour with an almost blackish mantle, in the absence of flecks or bands, and especially in the structure of the penis and its appendages. There are five penial appendages in *D. panormitanum*, which all are flagelliform: four being small and fused at their bases, the remaining one being somewhat larger and separate from the others. LESSONA & POLLONERA stated that these appendages do not resemble those of *D. agreste*<sup>1)</sup>. They emphasized that all five appendages are long, wide at their bases and neither hidden nor lobate but narrowing towards their distal ends.

Even if we admit a certain variability in these penial appendages of *D. panormitanum* (number, size, ...), their general aspect is very different from that in *caruanae* (two large horse-shoe shaped protuberances and 2-5 flagelliform appendages fused together at their bases but of constant width throughout their length).

Moreover the implantation of the penial appendages seems to be different in each species, being at the distal end of the penis in *D. caruanae*, but apparently not so in *panormitanum*. Unfortunately, other important anatomical characteristics were not mentioned in the original descriptions e. g. presence and structure of the sarcoelium.

In comparing *D. pollonerae* with *panormitanum*, the same differences as mentioned above are obvious—habitus, colour and penial appendages. In our opinion there is no doubt that *D. pollonerae* and *panormitanum* are specifically distinct.

In comparing *D. caruanae* with *pollonerae*, we find similarities in their habitus (length), their general colour and to a certain extent in their penial appendages: two large thin-walled protuberances and a bundle of smaller appendices. In these penial appendages the most striking differences are evident:

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<sup>1)</sup> *D. agreste* sensu auct. = *D. reticulatum* (MÜLLER 1774) [non *D. agreste* (LINNAEUS 1758)].

- the flagelliform appendages of *D. caruanae* are long (up to twice the length of the protuberances), smooth, unbranched, while in *pollonerae* they are short (shorter than the protuberances), crenate and branched (compared by SIMROTH [1889: 180] with the appendages of *D. agreste* sensu auct.);
- both protuberances of *D. caruanae* are elongate, rounded and bent, slightly unequal in length, while in *pollonerae* they are very different from each other (a large short one and a narrow long one which is bent);
- the short protuberance of *D. pollonerae* is glandular, which is not the case in *caruanae*.

After having dissected hundreds of specimens belonging to *D. caruanae* in all growth stages and with different degrees of contraction, we did not encounter a single specimen presenting penial appendages comparable with SIMROTH's description of *D. pollonerae*.

We consider it hazardous to accept that these two taxa are synonymous, because there is only a slight possibility that the characteristic form of the penial appendages of *D. pollonerae* is due to extreme contraction. In that respect only the supposedly striking differences with *D. caruanae* would appear to be artificial and the result of deformation.

It also is worth noting that in all the dissected specimens of *D. caruanae*, we observed a black pigmented connective tissue even when the material had been preserved for some considerable time (in some cases up to 10 years). On the contrary, SIMROTH (1889: 179) mentioned an almost clear "mesenterium"

The presence of a sarcobelum in *D. pollonerae* corresponds with what we find in *caruanae*, although this organ was not mentioned in the original description by POLLONERA (1891). Furthermore we think that *D. panormitanum* may also possess a sarcobelum, but are unable to deduce its form or structure. It is evident that some existing uncertainties could be resolved when living or freshly preserved *Deroceras* specimens from Palermo and Malta become available.

### Conclusion.

Regarding the habitus and the colour of *D. panormitanum*, and especially the form of its penial appendages, we think there is no reason to consider *caruanae* as a synonym of *panormitanum*.

After careful comparison of the penial appendages, as illustrated in the original descriptions, it seems to hazardous to accept that *D. caruanae* and *pollonerae* are conspecific.

Under the circumstances, *D. caruanae* (POLLONERA 1891) is, in our opinion, to be maintained as a valid species.

The authors made several unsuccessful attempts to obtain living or preserved slugs from Palermo in order to examine topotypic material of both Sicilian taxa, and to check their conclusion. They would very appreciate any help in this endeavour.

### Addendum (August 1984).

As a result of our attempts to obtain living or preserved slugs from Palermo, Dr. FERNANDO GHISOTTI, President of the Società Italiana di Malacologia, transmitted our request to Prof. Dr. FOLCO GIUSTI and to Dr. VITTORIO ORLANDO.

Prof. Dr. F. GIUSTI kindly sent us some preserved slugs from different localities and brought two of his papers on *Deroceras* to our attention. Herein he discussed the synonymy of *D. caruanae* (the references of these papers were mentioned in the Zoological Record, 117 [1980], published in december 1983).

We regret we cannot agree with all the conclusions of Prof. F. GIUSTI (1973: 215; 1976: 219) and we intend to continue our study on this interesting slug.

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