

Die Greiftaster der ♂ haben die Form, wie sie Fig. 1 zeigt, wobei zu bemerken ist, daß *l* den linken und *r* den rechten Taster darstellt, beide Taster aber etwas gequetscht wurden.



Fig. 1. *Candona pubescens* G. O. Sars.

Die Furcalglieder sind nur wenig gebogen; die beiden an der inneren Curvatur deutlich bedorneten Endklauen sind fast drei Viertel so lang wie der Hinterrand des Furcalgliedes, genaues Verhältnis = 14 : 20.

### 5. Salamanders with and without lungs.

By Dr. Einar Lönnberg, Upsala, Schweden.

eingeg. 10. November 1899.

By the investigations of Harris Wilder, L. Camerano, P. Moore and the present author it has been proved that many salamanders are normally deprived of lungs. To the list of such species I am able to add two namely: *Spelerpes longicauda* (Green) and *Spelerpes guttolineatus* (Holbrook). At least the former of these seems to have terrestrial habits as Cope in his work on »the Batrachia of North America«<sup>1</sup> says (p. 169): »This . . . is almost always found in rocky ground and in fissures and caves in cliffs. I have never seen it in the water.« The habits of the latter species are not known to me and Cope does not say anything about the same in the work mentioned.

The list of Salamanders known to be without lungs or to have these organs reduced is as follows:

Subfam. *Salamandrinae*:

*Salamandrina perspicillata* (Savi) (rudimentary: Camerano).

Subfam. *Amblystomatidae*:

*Amblystoma opacum* Gravh. (highly reduced, rudimentary: Lönnberg).

Subfam. *Plethodontinae*:

*Anaides lugubris* Hallow (absent: Wilder),

*Plethodon cinereus* (Green) (absent: Wilder),

*P. c. erythronotus* (Green) (absent: Wilder),

*Plethodon glutinosus* (Green) (absent: Lönnberg, Wilder),

<sup>1</sup> Bull. U. S. Nat. Mus. 34. Washington 1889.

*Batrachoseps attenuatus* (Eschsch.) (absent: Camerano, Wilder),  
*Spelerpes ruber* (Daud.) (absent: Wilder),  
*Spelerpes porphyriticus* (Green) (absent: Wilder),  
*Spelerpes longicauda* (Green) (absent: Lönnberg),  
*Spelerpes guttolinatus* (Holbr.) (absent: Lönnberg),  
*Spelerpes bilineatus* (Green) (absent: Wilder),  
*Spelerpes fuscus* (Bp.) (absent: Camerano),  
*Spelerpes variegatus* (Gray) (absent: Camerano),  
*Manculus quadridigitatus* (Holbr.) (absent: Lönnberg, Wilder).

Subfam. *Desmognathinae*:

*Desmognathus fusca* (Raf.) (absent: Wilder),  
*D. f. auriculata* (Holbr.) (absent: Lönnberg),  
*Desmognathus brimleyorum* Stejneger (absent: Wilder),  
*Desmognathus nigra* (Green) (absent: Moore),  
*Desmognathus ochrophaea* Cope (absent: Moore),  
*Leurognathus marmorata* Moore (absent: Moore)<sup>2</sup>.

Wilder has expressed the supposition that all the members of the subfamilies *Plethodontinae* and *Desmognathinae* may be lungless<sup>3</sup> and this seems still more probable now when some more species have recently proved to be without lungs. But this peculiar character is, as a rule not extended to the members of the subfamilies *Salamandrinae* and *Amblystomatinae*. Camerano has made investigations upon this subject<sup>4</sup> and not to mention the lungless forms, directed his attention to *Salamandra* 2 sp., *Chioglossa* 1 sp., *Molge* 10 sp., *Tylototriton* 1 sp. and *Amblystoma* 1 sp. In all these forms he has found well, although differently developed lungs. As this question is of great interest, I think the following statements may not seem uncalled for derived as they are from investigations of two rare genera not yet studied with regard to this subject as well as of two species of *Amblystoma* and three species of *Molge* in which the condition of the lungs was not known before.

*Molge vittata* (Gray)

from Kadjani, Caucasus. The length of the lungs is a little more than 60 percent of the distance from the snout to the middle of the cloaca.

*Molge pyrrhogastra* (Boie)

from Japan. The length of the lungs is not quite 60 (59,5) percent of the length of head and body measured as is mentioned above.

<sup>2</sup> *Leurognathus marmorata*, a new genus and species of salamanders of the family *Desmognathidae*. Proc. Acad. Sc. Philadelphia 1899.

<sup>3</sup> Wilder: Lungless Salamanders (second paper), Anat. Anz. Bd. 12. No. 7. Jena 1896.

<sup>4</sup> Camerano: Nuove Ricerche intorno ai Salamandridi normalmente apneumoni, Ac. Real. Sc. Torino. Anno 1895—1896.

*Molge Poireti* (Gerv.).

The length of the lungs is only 39,3 percent of the length of head and body.

*Salamandrella Keyserlingii* Dyb.

from Ekaterinenburg, Ural, has the lungs extending fully half way between the axilla and the groin thus being 45,2 percent of the length of head and body.

*Ranidens sibiricus* Kessler

from Kopal, Altai mountains. The lungs are only 38,4 percent of the length of head and body and extend half way between the axilla and the groin.

*Amblystoma punctatum* (Lin.)

North America. The length of the lungs are 41 percent of the length of head and body.

*Amblystoma microstomum* Cope.

from St. Louis Mo., U. S. A., has the lungs 44,6 percent of the length of head and body and extending half way between the axilla and the groin.

We see from this that the salamanders mentioned above can, with regard to the development of their lungs, be divided into two classes, namely, 1) such in which the lungs extend to the groin and are about 60 percent of the length of head and body, and 2) such in which the lungs extend only about half way between axilla and groin and measure only from 45 to 38 percent of the length of the head and body. Camerano has rightly pointed out the importance of the lungs as an hydrostatic organ and it seems quite probable that the great length of the lungs in many forms is an adaption to aquatic life. But the lungless salamanders are not necessarily obliged to lead a terrestrial life, even if many of them do so, on the contrary, some of them are very positively aquatic in their habits. In the latter case, however, they do not swim suspended in the middle of the water, as the species of *Molge*, but crawl or wriggle at the bottom. It can thus be said that their movements often are terrestrial although they live in the water. This can be proved about some species with quotations from Cope: »The Batrachia of North America«<sup>5</sup>). He says, for instance about *Spelerpes bilineatus* (l. c. p. 166) that it is »to a great extent a water animal«, but: »It is only in shallow stony brooks that it occurs« . . . »It is very active, and wriggles and runs from the pursuer in the same manner as, and generally in company with, the

<sup>5</sup> Bull. U. S. Nat. Mus. No. 34.

*Desmognathus fusca*.« About this latter the same author also uses the words: »it runs and wriggles«. About *Desmognathus nigra* he says: »This creature is aquatic; but . . . it occurs only in shallow stony brooks.« About the recently discovered *Leurognathus* Professor Moore (l. c. p. 322 und 323) informs us that it lived »in a large clear rocky pool« and »swims rather sluggishly, but with an easy gliding motion« and »took refuge under the large rocks scattered through the pool«. This latter form is however more of a swimmer than the other lungless salamanders as its compressed tail indicates. But the tail is shorter than the head and body taken together and the »form is rather robust« it can therefore be supposed that even this form chiefly moves at the bottom and thus has no need of a hydrostatic organ.

## 6. Neue Beiträge über Hydrachniden.

Von Rich. Piersig, Annaberg.

(Mit 10 Figuren.)

eingeg. 11. November 1899.

In den Sommerferien dieses Jahres unternahm ich eine wissenschaftliche Excursion in den Schwarzwald, den Allgäu und das Wettersteingebirge, um die Hydrachnidenfauna dieser Gegenden zu untersuchen. Die Ausbeute war im Allgemeinen dürftig, besonders im Schwarzwalde, dessen Seen meist eine moorige Beschaffenheit aufweisen. Bei flüchtiger Durchsicht des Materials, das erst nächstes Jahr eingehend geprüft werden kann, bemerkte ich einige neue Formen, die hier kurz beschrieben werden sollen.

### 1. *Feltria Georgei* n. sp.<sup>1</sup>.

♂ Rumpflänge 0,32 mm, Breite 0,224 mm, Körpermitz von oben breit oval, ohne bedeutenden Einschnitt am Hinterende. Färbung röthlich. Am Vorderrande mit zwei 0,032 mm von einander abstehenden, breiten und niedrigen Drüsenhöckern ausgerüstet, auf welchen seitlich je eine kräftige, schief nach oben und innen gerichtete Borste entspringt. Sämmtliche Hautdrüsenhöfe schwach chitinisiert, zum Theil höckerartig vorspringend. Oberhaut deutlich liniert. Rücken nur flach gewölbt, mit einem verkehrt ovalen Schild von ca. 0,2 mm Breite und 0,28 mm Länge, am seitlichen Vorderrande die schwarzpigmentierten, 0,06 mm von einander abstehenden Doppelaugen überdeckend. Ohne Nebenschilder am hinteren Körperende, diese vielmehr mit dem Hauptschilde völlig verschmolzen. Hinterer Fortsatz des Capitulum (Maxillarorgans) mäßig lang ausgezogen, jederseits am freien Ende in eine kräftige Spitze umgebogen. Palpen merkbar stärker als die Grundglieder des ersten Beines, doch nicht so dick wie bei den Männchen von *Feltria rubra* Piersig, das übrigens auch der deutschen Fauna angehört. Viertes Palpenglied am längsten, mindestens eben so stark wie das 2. Grundglied gebaut, mit

<sup>1</sup> Zu Ehren des verdienstvollen englischen Hydrachnidologen C. F. George, M.R.C.S., benannt.

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