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Case of the asymmetric teratology in *Hemicrepidius niger* (L.)
(Coleoptera: Elateridae)

Przypadek asymetrycznej teratologii ciała u *Hemicrepidius niger* (L.) (Coleoptera:
Elateridae)

SUMMARY

In this paper the teratology in *Hemicrepidius niger* (L.) (Coleoptera: Elateridae) was described and illustrated. Anomalies of the body structure concern: deformation of the left part of pronotum and prosternum with jumping process, displacement of the left elytron and lack of the left foreleg including the coxal articulation. The authors discuss the reasons of this teratology.

STRESZCZENIE

W pracy opisano i zilustrowano przypadek asymetrycznej teratologii ciała u *Hemicrepidius niger* (L.) (Coleoptera: Elateridae). Anomalie struktury ciała dotyczą: deformacji lewej części przedplecza i przedpiersia — z wyrostkiem skokowym włącznie, przesunięcia lewej pokrywy oraz braku wykształcenia lewej nogi na przedpiersiu. Autorzy dyskutują o możliwych przyczynach powstałej teratologii.

Key words: Coleoptera, Elateridae, click-beetle, *Hemicrepidius niger*, teratology.

INTRODUCTION

In the nature, beside a great number of insects of species of typical appearance, there exist forms morphologically and anatomically deformed. Such changes, named teratologies, can have a variety of forms. They are usually distortions, reductions or multiplication of various body parts of the discussed animals. Asymmetrical anomalies (affecting one side of the body) occur

more frequently than symmetrical ones. The former can be most frequently caused by mechanical damage or by various unexplained development disorders in pre-imaginal stages resulting in deformations in adult specimens. One cannot also exclude the influence of certain chemical substances (e.g., agricultural chemicals) on the teratology process. In home literature there can be found relatively numerous descriptions of asymmetrical changes in beetles, and, mainly, the following are mentioned: the existence of additional legs (10, 13), cleft of tarsi segments or their multiplying (5, 7, 9), the lack of some antennae segments or the presence of additional segments as well as their atypical construction (5, 8). Cases of teratology in the elytra microstructure have been reported (2, 15). An occurrence of additional, atypical eye on the head has also been described (6).

There is relatively little information about symmetrical anomalies observed in beetles, whose appearance is probably genetically based. Teratologies of this type were recorded in the case of the occurrence of double copulatory apparatus (1), symmetrical processes placed on the pronotum sides (14), symmetrical distortion of the pronotum (4) and a different colouring of the whole elytron (3).

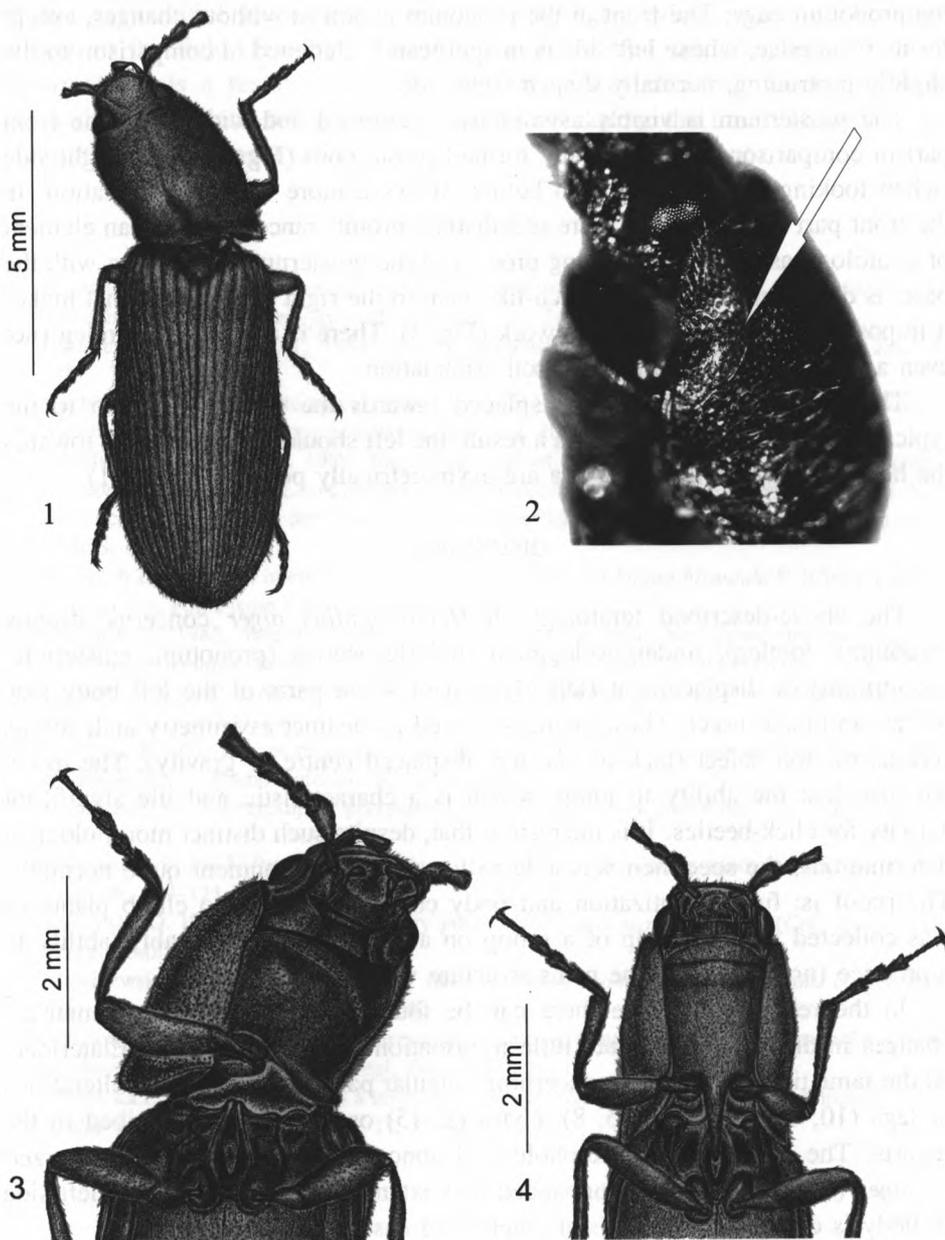
The present report describes an interesting case of asymmetrical morphological abnormality in *Hemicrepidius niger* (L.), a click-beetle.

MATERIAL AND METHODS

The examined male specimen comes from middle-eastern Poland — from Sandomierska Lowland: Kolonia Sokołówka (UTM — FB10). It was collected with the help of a scoop on a narrow strip of meadow placed between grain fields. The drawings (Figs 1, 3, 4) were made with the use of a microscope with lucid camera and the microscope with photo camera (Fig. 2).

RESULTS

Visible deformations were observed in the structure of the pronotum, the left episternite, the prosternum and the left elytron. The anomaly of the pronotum concerns its left side, while its right side is properly developed. The left side of the pronotum (Fig. 1) shows a distinct shortening (2 mm long) in comparison to the normally formed right side (2.9 mm long). It is sinus-like at the distance of about 1/5 from the base of the pronotum; the back angle is round, not extended backwards, and the keel is lacking. The left edge of the pronotum is developed only in the front part; it forms an atypical, sharply bent downwards arch (Fig. 2). Consequently, the back part of the pronotum in the left side of the body distinctly overlaps the side of the prothorax. The left episternite of the prothorax is reduced (it is much smaller than the normally formed right one), bent and has a rough surface. These deformations of the left side caused that the whole prothorax is turned strongly to the left in relation to the body's longitudinal axis, and the pronotum surface slopes slightly towards the right side. In the back part of the pronotum there is a flat protuberance divided by a deep, longitudinal cavity (Fig. 1). This cavity spreads from the base of the pronotum forwards at the distance of 1/4 of its length, and then it takes the form of a slight furrow disappearing near



Figs 1–4. *Hemicrepidius niger*, adult; (1–3) teratological specimen. (1) habitus; (2) the side of pronotum; (3) anterior part of the body (ventral aspect); (4) anterior part of the body of a typical specimen (ventral aspect)

the pronotum edge. The front of the pronotum is almost without changes, except for its front edge, whose left side is insignificantly flattened in comparison to the slightly protruding, normally shaped right side.

The prosternum is visibly asymmetric, shortened and widened in the front part in comparison to the typically formed prosternum (Figs 3, 4); its right side (when looking at the insect from below) shows a more visible deformation. In the front part of its left side there is a distinct protuberance, which is an element of teratology as well. The jumping process of the prosternum, beginning with the base, is deformed and strongly arch-like bent to the right to an extent that makes it impossible for the apparatus to work (Fig. 3). There is also no left foreleg (not even a trace of it) including the coxal articulation.

The left elytron is slightly displaced towards the front in relation to the typically situated right elytron. As a result, the left shoulder is protruding towards the head and both apices of elytra are asymmetrically positioned (Fig. 1).

DISCUSSION

The above-described teratology in *Hemicrepidius niger* concerns atrophy (prothorax foreleg), underdevelopment and distortions (pronotum, episternite, prosternum) or displacement (left elytron) of some parts of the left body side of the examined insect. These changes caused its distinct asymmetry and, surely, serious motion defect (lack of one leg, displaced centre of gravity). The insect has also lost the ability to jump, which is a characteristic and life significant activity for click-beetles. It is interesting that, despite such distinct morphological deformations, the specimen was able to live in the environment quite normally. The proof is: full sclerotization and body colouring, ability to climb plants (it was collected with the help of a scoop on a meadow) and, probably, ability to reproduce (no changes in the penis structure were found).

In the relevant literature there can be found descriptions of asymmetrical changes in different beetles but little information is assembled about Elateridae. At the same time the changes concerning singular parts of body like the alterations of legs (10, 13), antennae (5, 8), elytra (2, 15) or eye (6) are described in the reports. The asymmetrical morphological abnormalities found in characterized *H. niger* (L.) are very big, pronounced and extensive (almost the whole left side of body is changed). Thus it is an interesting case of teratology.

The causes of the described teratology are not clear. Their asymmetry rather excludes a genetic basis. The anomalies could probably be the effect of mechanical damage of the left side of the pupa, which took place at the end of the imaginal structure formation stage. It may have happened, for example, during the spring farming work. This assumption is confirmed by the place (the surface layer

of the agricultural lands) and the time (May–July) when pupae of *H. niger* appear in the field. Possible, though probable, is that the occurrence of such deformations is a result of the influence of certain chemical substances (e.g. pesticides) often introduced to the environment during the time duration of the mentioned development stage.

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