INT. J. BIOL. BIOTECH., 3 (2): 249-252, 2006.

ACILIUS CANALICULATUS NICOLAI (COLEOPTERA: DYTISCIDAE): FIRST TIME DESCRIBED WITH SPECIAL REFERENCE TO ITS MALE AND FEMALE GENITALIA FROM PAKISTAN

Tabinda Attique, Syed Kamaluddin and Tanveer Fatima

Department of Zoology, Federal Urdu University of Arts, Science and Technology, Gulshan-e-Iqbal Campus, Karachi.

ABSRACT

Acilius canaliculatus Nicolai, water beetles described first time with refrence to it's male and female genitalia from Sindh,Paksitan. The systematic position with in the genus is also briefly discussed using apomorphic characters.

Key-words: *Acilius canaliculatus*, Coleoptera, Dytiscidae, systematic position, Pakistan.

INTRODUCTION

Lutz(1908) in his Fauna Germanica illustrated two species of the genus *Acilius*. Junk(1920) in his catalogue listed four species of the genus *Acilius* including *A.canaliculatus*. Hatch (1953) described beetles of Pacific north west with a key to the five species of the genus *Acilius* except *A. canaliculatus*.

Zeitsev (1972) described the genus *Acilius* Nicolai and keyedout the genera and five species including *A. canaliculatus*. He also gave a brief description of three species of the genus *Acilius* from European USSR, West Siberia, Maritime Territory, Asia, North West Africa, China, Japan. Khatoon and Ali (1975, 1976, 1977 and 1979) studied an extensive work on equatic Coleptera of Pakistan but they did not include any species of the genus *Acilius* in their work.

Hashmi and Tashfeen (1992) listed 17 genera of the family Dytiscidae in their Coleoptera of Pakistan, but they did not mention any species of the genus *Acilius* . Nilsson (1996) has been worked on diving water beetles of the family Dytiscidae, concerning with breeding habitat of *Acilius* and predaceous nature of feeding on micro-crustaceans and also formulated a key to the genera using adult and larval morphology. Recently Kamaluddin and Attique (2004) attempted a cladistic analysis of genera of the family Dytiscidae from Pakistan and discussed in detail the apomorphies found in the genera.

MATERIALS AND METHODS

The specimens were collected from Sindh, Thatta and Dadu on light and Halejee Lake and Kancher Lake and preserved in 70% alcohol and identified with the help of Zaitsev (1972) and standard literature. For the study of male and female genitalia the abdomen was removed from the base and was warmed in 10% KOH on a bench lamp for about 10 minutes. These were then washed with tap water and were dissected and inflated under Leitz binocular microscope in the same medium. The examination of various structures and their diagrams were made placing these on the cotton threads immersed under glycerin with the help of eyepiece graticule. The abdomen was dried and reattached to the specimen with the help of insect gum and the genitalia were preserved in microvials with drop of glycerin pinned with the specimen.

Acilius Leach**.**
Acilius Leach, 1817, *Zool, Misc, III*: 69; Gschwendtner, 1937: 32; Csiki, 1946: 682; Guignot, 1947: 235; Zaitsev, 1972, *Faun. USSR. Col*. *4*: 1–401.

Diagnostic feature:

Body obovate, dorsally convex, dorsally especially elytra with dense large dots, elytra of female with four broad longitudinal groove with hairs, head longer than broad, anteocular distance about ½ of its width, pronotum much broader than its length, anterior and humeral angles acute, scutellum not covered, short, triangular, prothoracic process broad, broadly oval, rounded at the end, lateral wings of metathorax very norrow, broadened into lobes sub-apically, fore tarsi of male with one large and two small suckers and a large number of very small adhesive tubes,

mid tarsi almost not broadened with large numbers of adhesive tubes among the long natatorial hairs, parameres large and broad, aedeagus large, rod–shaped, distally broad bend inwardly.

Comparative note:

This genus is most closely related to *Hydaticus* Leach in having pronotal process rounded at the end, pronotum without lateral ridge, smooth, but it can easily be separated from the same in having hind tibiae with terminal spur blunt, anterior outer margin of lateral wings of metathorax strongly curved incontrast hind tibiae with terminal spur pointed, anterior outer margin of lateral wings of metathorax straight in *Hydaticus* and by the other characters as noted in the description.

Distribution:

Occur in Holarctic and Oriental regions.

Type species:

Dytiscus sulcatus L.

Acilius canaliculatus Nicolai
(Figs.1-8)

Acilius canaliculatus Nicolai, 1822, *Diss. Col. Agri. Hal.*: 29*;* Gschwendtner, 1937: 35*; Csiki,* 1946: 684*;* Guigonot, 1947,: 237,
Acilius laevisulcatus Mochulskii. 1845, *Bull. Soc. Nat., Mossou, xviii, 1*: 30*; ab.* Kotulae Ulanowsky, 1883, *Ber. Phys. Com. Acad. Karakau, xvii*: 6, Zaitsev, 1972, *Faun. USSR.Col.4*:1-401.

General shape:

Body ovate, broadly oval.

Colouration:

Body generally light brown with fine black punctures, except head excluding posterior margin, pronotum except some minute black stripes, lateral bands of elytra yellow ; posterior margin of head, some minute black strips on pronotum black.

Head:

Head distinctly more than 1.5X broader than long, anteocular distance 0.5mm, posterior of head including eyes 1.1mm, width of head including eyes 2.7mm, eyes prominent, basal segments of antennae longest, longer than 5^{th} to 11^{th} segments, 2^{nd} segments slightly longer than 3^{rd}, 3^{rd} segment longest, maxillary palpi with basal segments shortest, 4^{th} longest.

Thorax:

Pronotum distinctly more than 3X broader than long, length of pronotum 1.4mm, width 4.6mm, lateral margins of pronotum slightly sinuated, anterior and humeral angles acute, anterior margin of pronotum sinuated, posterior margin of pronotum sinuated, scutellum not coverd, short, triangular, apex sub-rounded, distinctly more than 2X broader than long, length of scutellum 0.3mm, width 0.8mm, lateral margins of elytra convex, posterior margin of elytra sub-rounded, length of elytra 8.4mm, width 2.8mm, spurs of all tibiae unequal and pointed, hind tibiae with one claws.

Abdomen :

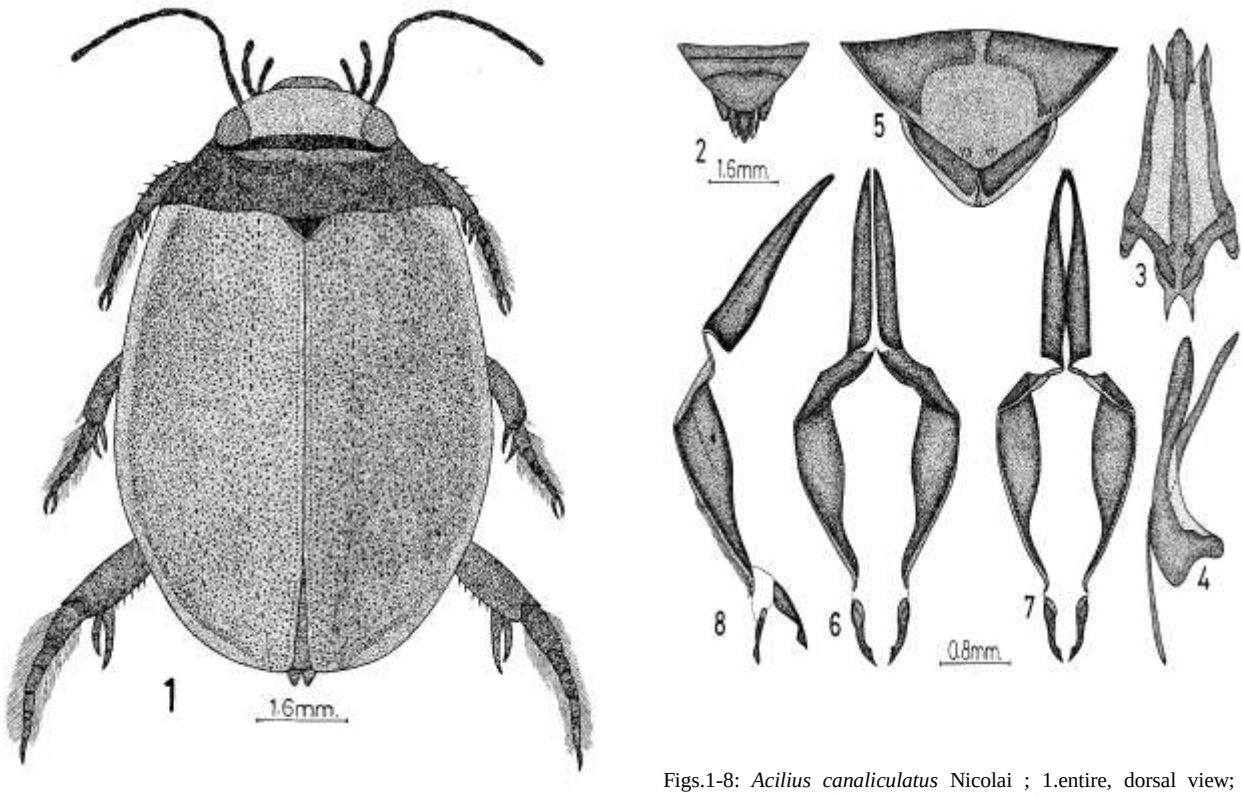
Abdomen convex, beneath, unarmed, pygidium (Figs.2and5) covered. Total length 11.7mm

Male genitalia (Figs.3 & 4)

Paramere (Fig.3) large, broad, lateral margin distinctly sinuated, distally sub-rounded, inner margin slightly sinuated, outer proximal end sub-roundly produced ; aedeagus (Fig.4) large, rod-shaped, proximally dilated, distally broad with sub-rounded apex, slightly bend inwardly.

Female genitalia (Figs. 6-8):

The anterior stylus very large, plate-like, the posterior stylus rod-shaped distally truncated with a sharp short spine, the eight paratergites large, posteriorly with a triangular shaped notch, first gonocoxae lobe-like, posteriorly sinuated.



Figs.1-8: *Acilius canaliculatus* Nicolai ; 1.entire, dorsal view; 2.pygidium, male, dorsal view; 3.male genitalia, dorsal view; 4.same, lateral view; 5. Pygidium, female, dorsal view, 6. female genitalia, dorsal view, 7.same, venteral view, 8.same, lateral view.

Material examined:

Two males, two females; Pakistan, Sindh, August, 2002; leg. Zubair Ahmed, Tabinda Attique ; lodged at author's supervisor collection.

Comparative note:

This species is most closely related to *A.sinesis* Peschet in having hind legs including femora uniformly reddish brown but it can easily be separated from the same in having pronotum with 2-black bands, elytra yellow in both sexes with dense black speckles, punctuation on elytra of male uniformly dense in contrast pronotum with only one band, elytra light with a few black speckles in female, almost without black speckles in males and punctuation of elytra of male more scattered at the base in *A. sinensis* and by the othter characters as noted in the description.

DISCUSSION

The representatives of the genus *Acilius* Leach., are distributed in Holarctic and Oriental regions. This genus plays sistergroup relationship with *Hydaticus* Leach by their synapomorphies like pronotal process rounded at the end, pronotum without lateral ridge, smooth and outgroup relationship by its autapomorphies like hind tibiae with terminal spur blunt, anterior outer margin of lateral wings of metathorax strongly curved.

The species *A. canaliculatus* Nicolai first time reported from Sindh, Pakistan plays sister group relationships with *A. sinesis* Peshet recorded from Pakistan by their synapomorphies like hind legs including femora uniformly reddish brown and out group relationship by its autapomorhies like pronotum with 2-black bands, elytra yellow in both sexes with dense black speckles, punctuation of elytra of male uniformly dense.

REFERENCES

Hashmi, A. S. and A. Tashfeen (1992). Coleoptera of Pakistan. *Proc. Pakistan. Congr. Zool.*, 12: 133-170.
Hatch, M. H. (1953). *The beetles of the Pacific north west*, part I : Introduction and Adephaga. 16: 1-340.

Khatoon, S. and S.R. Ali (1975). Aquatic Coleoptera of Pakistan – 1. *Bull Hydrobiol. Res. Gordon College, Scr.* 1: 68-72.

Khatoon, S. and S.R. Ali (1976). Aquatic Coleoptera of Pakistan – 2, *Bull. Hydrobiol Res. Gordon College, Scr*.I: 187-199.

Khatoon, S. and S.R. Ali (1977). Aquatic Coleoptera of Pakistan – 3. *Bull. Hydrobiol. Res. Gordon. College, Scr.* 1: 228-246.

Khatoon, S. and S.R. Ali (1979). Revision of Coleoptera of Pakistan. *Bull. Hydrobiol. Res*., (22 & 24): 503 – 594.

Nillson, A. N. (1996). Aquatic Insects of North Europe – A Taxonomic handbook, Coleoptera Dytiscidae, Diving water beetles. *Universtiy* of *Umea*: 145 – 172.

Junk, W. (1920). Coleopterorum Catalogus, Part 71:1-266, Berlin W. 15

Kamaluddin, S. and T. Attique (2004). A cladistic analysis of the genera of family Dytiscidae (Coleoptera) from Pakistan. *Int. J. Biol. Biotech*., *1*: 449-458.

Lutz, K.G. (1908). Fauna Germanica. *Stuttgart 1*:32-40.

Zaitsev, Y. (1972). The Fauna of USSR Coleoptera. *Fauna. USSR. Col. 4*: 1-401.

(*Accepted for publication February 2006*)