



Research Article

A NEW RECORD OF *ANDRALLUS* (PENTATOMIDAE: ASOPINAE) FROM KHAIRPUR DISTRICT SINDH, PAKISTAN

*Shabana Mangi, Abdul Manan Shaikh, Waheed Ali Panhwar,
Hafeeza Gul and Reshma Sahito

Department of Zoology, Shah Abdul Latif University, Khairpur-66020, Pakistan

Article History: Received 21st March 2019; Accepted 19th April 2019; Published 2nd June 2019

ABSTRACT

During the present study of 78 specimens were captured from the district Khairpur Sindh Pakistan. The specimens were identified into single genus *Andrallus* (Bergroth (1905) and single species *Andrallus spinidens* (Fabricius 1787) the finding of this species constructed new record for the present region, besides this description of species along with genitalia description also provided. Hopefully, the present study will be basic tool for the identification of this species.

Keywords: New record, Pakistan genus, Species, Genitalia.

INTRODUCTION

Genus *Andrallus* reported was erected by Bergroth, (1905) with type of species *Cimex spinidens* (Fabricius, 1787) this species was synonymies into *Andrallus spinidens* (Fabricius, 1787), they have an only species, this genus is identified on the basis of taxonomical characters are head larger than wider; scutellum larger then wider at the base; humeral angles harshly tapered; antennae five segmented; rostrum has four portions, its first part connected to head, *Andrallus* (Bergroth, 1905) is a popular genus of the subfamily Asopinae they are used as natural biological pest control in rice crop in Pakistan, Iran India, Malaysia and identified at all worldwide (Mohaghegh & Najafi, 2003; Nageswara Rao, 1965). Nymphs and adults feed on numerous caterpillars for instance: *Helicoverpa armigera*, *Chilo suppressalis* and *Naranga aenescens* at northern Iran in the rice crop, produced five generations per year and regulate the rice pest populations (Najafi-Navaee *et al.*, 1998). *A. spinidens* (Fabricius, 1787) is an unfocused killer of Coleoptera, Lepidopterous larvae in rice fields (Manley, 1982). 2nd to 5th instars' adults and nymphs of *A. spinidens* have grasping activity movement on rice pests' larvae such as *Chilo suppressali* (Afzal & Ahmad, 1981). *A. spinidens* (Fabricius, 1787), as relatively small life cycle, violent

feeding activities and capacity to feed constantly for more than a few hours (Manley, 1982). This *A. spinidens* predatory enemy also attacked the *B. bassiana* and *A. spinidens* (Fabricius, 1787), is species have great economic importance. They have are predatory in nature, used as natural pesticides and play an important role in biological pest control. They feed on the various larva of butterflies, moth, beetles and other pest species of (Lepidoptera, Coleoptera and Hymenoptera). The pest species feed on different crops such as wheat, rice, weed, herbs, shrub, soybean, mustard, tomato, vegetables etc. (Distant, 1902; Rider, 2013). Many authors contributed their important work on the taxonomy of *Andrallus* and Pentatomidae family in the worldwide (Ahmad, 1979; Imtiaz Ahmad *et al.*, 1974; Azim, 2011; De Clercq, 2000; Rider, 2013; Rider, 2014). Less work has been done from Pakistan by Ahmad *et al.* (1974), Ahmed (1979) and Rana and Abbasi (1985). It was, therefore, the present study was designed.

MATERIALS AND METHODS

The current study was approved in District Khairpur of Sindh, Pakistan for the duration from (March 2014 to October 2016). Throughout the present investigation, thirty females and forty-eight male specimens of the genus

*Corresponding Author: Dr. Abdul Manan Shaikh, Department of Zoology, Shah Abdul Latif, University, Khairpur-66020, Pakistan, Email: mangishabana52@gmail.com, Mobile: 92+3433754844

Andrallus (Bergroth, 1905) were collected from various localities of District Khairpur. Stink bugs were taken by light trap and accepted method collected from different crops fields by hands picking pattern. The serene specimens were reserved in glass bottles; they have made soft and immobilized with the help of chloroform. Equipments were carefully arranged and conserved appropriately in particular timber insect's wooden boxes and marked as per the traditional method. Naphthalene balls are worn for defiance and conservation of insects as of fungus, predators (ants) as well as reported through the facilitation of appropriate reports (Rana, 1985). The middle portion of male bugs is exertion at the posterior region dipped into Potassium hydroxide (KOH) and boiled for (10-15) minutes. Male genitalia, Aedeagus, Parameters, and Pygophore were separated by the facilitation of fine forceps from the abdomen and clean with tap water and examined under the dissecting microscope (Khowa optical microscope, model sdz-pl) by Ahmad, (1979); Imtiaz Ahmad *et al.*, (1974); McPherson, (1982). The abdomen of female was exertion at the base dipped into Potassium hydroxide (KOH) and boiled for 5-10 minutes. The genitalia of female specimens were separated from the abdomen by the facilitation of fine forceps, clean with tap water and observed with the facilitation of dissecting microscope (Schaefer, 1968). Dissected genitalia were conserved into the micro vial into the dive of glycerin and reattached the specimen. All the body parts measured taken into mm (millimeters) through the ocular micrometre. Illustrations were pinched lying on graph paper by means of ocular graph below the dissecting microscope (Afzal & Ahmad, 1981). Images were traced with turning pointer upon butter paper. Specimens Paratype were deposited in the Department of Zoology, Shah Abdul Latif University Khairpur.

RESULTS AND DISCUSSION

Body tint light, brownish with dark spots, black head further lengthened than breadth, a lengthened piece of antennae, third piece black, fourth, fifth piece dark brown, eyes black, yellowish humeral angles, brunette scutellum, blond to yellowish, dark brown wings through black spots, on the frontal piece of abdominal piece have black spots and dark black spots on the central portion of abdomen, a black dots there is complete second abdominal piece, black cross dots blocked to spiracles. Black legs, Joints of legs femora, tibia a yellow, tarsal piece dark lime to blackish.

Head elongated than breadth, clypeus smaller than paraclypeus, total head length 2.3 mm, breadth 2 mm, antennae five pieces first antennal piece small closed to head, hairs nearby and second piece longer than other pieces, length of first antennal piece 0.2 mm, length of the second antennal piece 1.8 mm, length of third antennal piece 1.2 mm, length of fourth antennal piece 1.5 mm and length of fifth piece 1 mm, antennal formula $1 < 3 < 2 < 5 < 4$, labium four pieces, the second piece of labium longer than first, third piece. Asopinae bug have a broad little

labium, incassated first piece. The first piece length 1.3 mm, 2nd piece length 1.4 mm, third piece length 1.1 mm, fourth piece length 0.9 mm, labial formula $1 < 2 < 4 = 3$. The measurements of the anterior anteaocular detachment 1.1 mm and back of eyes subsequent length 2 mm, interocular places 1.6 mm. The width of pronotum more than length, frontal sides hollow, turned basal area, whole thorax enclosed by dots, the pronotal length 2.9 mm, breadth 6.5 mm and, frontal angles tapered, long spine attached with small spine, elongated scutellum than breadth, frontal margins broader than later, the scutellum tilt smooth, scutellum length 5 mm, breadth 4 mm.

Curved shape, ventrolateral margins plane congested to lateral boundaries broad, little spine near on the connexivum, spine not present on abdomen, wings covered the abdomen. Length of *A. spinidens* Asopinae, female species 12.5 mm, male species 12 mm, sternum broader in center. Legs covered with hairs and dots, spine not present on frontal femora. The lateral sides of 1st gonocoxae rounded, eighth paratergites bend triangular, the outer sides of ninth paratergites bent, posterior sides of second gonocoxae concave, big elliptical spermathecal bulb, slender pump area, bag-like middle area.

Pygophore broader than longer, dorsolateral lobe covered with a row of bristles, innermost dorsoposterior sides, posterior sides thin as compared to frontal, f shaped paramers, blade sharp outer sides rounded, inner sides curved, stem long, aedeagus blow up, similar to tree shape, conjunctival appendages apically two lobes in the center, a dorsolateral conjunctival appendages minute in breadth, long and thecal sides minutely concave. Pakistan: 49♂, 29♀, Sindh Prov. Khairpur 2016, S. Mangi, Wheat. Rice field.

The genus *Andrallus* reported by Bergroth, (1905), with type species *Audientia* (Ellenrieder, 1862), *Cimex audientia* (Stal, 1867) synonymies into *A. bergrothi*, other includes *Asopus geometricus* (Burmeister, 1835), *Arma geometricus* (Dallas, 1851), *Audinetia aeuleata* (Ellenrieder, 1862), *Acanthidium cinctum* (Balazuc, 1971), *Audinetia spinidens* (Distant, 1902) *Cimex spinidens* (Fabricius, 1787), *Pentatoma alienea* (Westwood, 1837), *A. spinidens* (Schouteden, 1907), (Ahmad, 1979; Imtiaz Ahmad *et al.*, 1974; Gapud, 1991), were synonymies into species *A. spinidens* (Fabricius, 1787); *A. spinidens* is a carnivore stink bug; they are biological pest control on rice, wheat and mostly used as pesticides. *A. spinidens* has potential to reduce the phytophagus species on rice (Najafi-Navae *et al.*, 1998). Genus *Andrallus* (Bergroth, 1905) reported from different localities of Pakistan identified *A. spinidens* from Karachi, Hyderabad in Sindh, Panjgur in Baluchistan (Imtiaz Ahmad *et al.*, 1974) *A. spinidens* recovered from various localities of Tandojam, Thatta, Sujawal and Karachi in Sindh, Faisalabad, Bahawalpur in Punjab, Sylhet, Bangladesh, and Panjgur in Baluchistan (Rana, 1985). *Asopus* (Burmeister, 1835) body closely interrupt, rosy; head covered with a dots at bottom; three black dots on the pronotum; two dots at frontal margin; scutellum dotted at bottom angles; black forewing

membrane; black abdomen lower surface covered with stripes, genitalia Clasper, vigorous, posterior edges have small wrinkles, sides bended *Audientia spinidens* (Distant, 1902), body lengthened grayish, fair; head elongated than width long paraclypeus longer than clypeus; pronotum wrinkles on the frontal side, curved, a median central area with dark punctures; antennal sections black with soft line, humeral angles; scutellum slightly elongated and pointed; corium covered with parallel lines; femora without arms; small spine are present on ventral sides; soil color of corium; the ventral sides of abdomen blackish.

Clasper curved on inner sides. *Cimex spinidens* (Fabricius, 1787), this type of predatory bug collected from the warm places the field rice. Brown to bright out lines upon the middle of the thorax and boundaries of the corium, spermatheca short in length, bulb elongated, parameres blade tapered. *Audientia aeuleata* (Ellenrieder, 1862), brownish, grey, body color, paraclypeus longer than clypeus, body covered with black spots, on the head parallel lines, head longer than width, pronotum broader than longer, parameres spindle shaped, aedeagus elongated,

spermatheca saclike, bulb round, and blade pointed. *A. spinidens* recovered from various localities of Tandojam, Thatta, Sujawal and Karachi in Sindh, Faisalabad, Bahawalpur in Punjab, Sylhet, Bangladesh, and Panjgur in Baluchistan (Imtiaz Ahmad *et al.*, 1974; Rana, 1985). But present species is differentiated on the basis of head elongated than breadth, clypeus smaller than paraclypeus, body tint light, brownish with dark spots, black head further lengthened than breadth, a lengthened piece of antennae, third piece black, fourth, fifth piece dark brown, eyes black, yellowish humeral angles, brunette scutellum, big elliptical spermathecal bulb, slender pump area, bag like middle area. Pygophore is broader than longer, dorsolateral lobe covered with row of bristles, inner most dorsoposterior sides, posterior sides thin as compared to frontal, f shaped parameres, blade sharp outer sides rounded, inner sides curved, stem long, aedeagus blow up, similar to tree shape, conjunctival appendages apically two lobes in center, a dorsolateral conjunctival appendages minute in breadth, long and thecal sides minutely concave and therefore present study as new record at Khairpur Sindh, Pakistan (Table 1 & Figure 2).

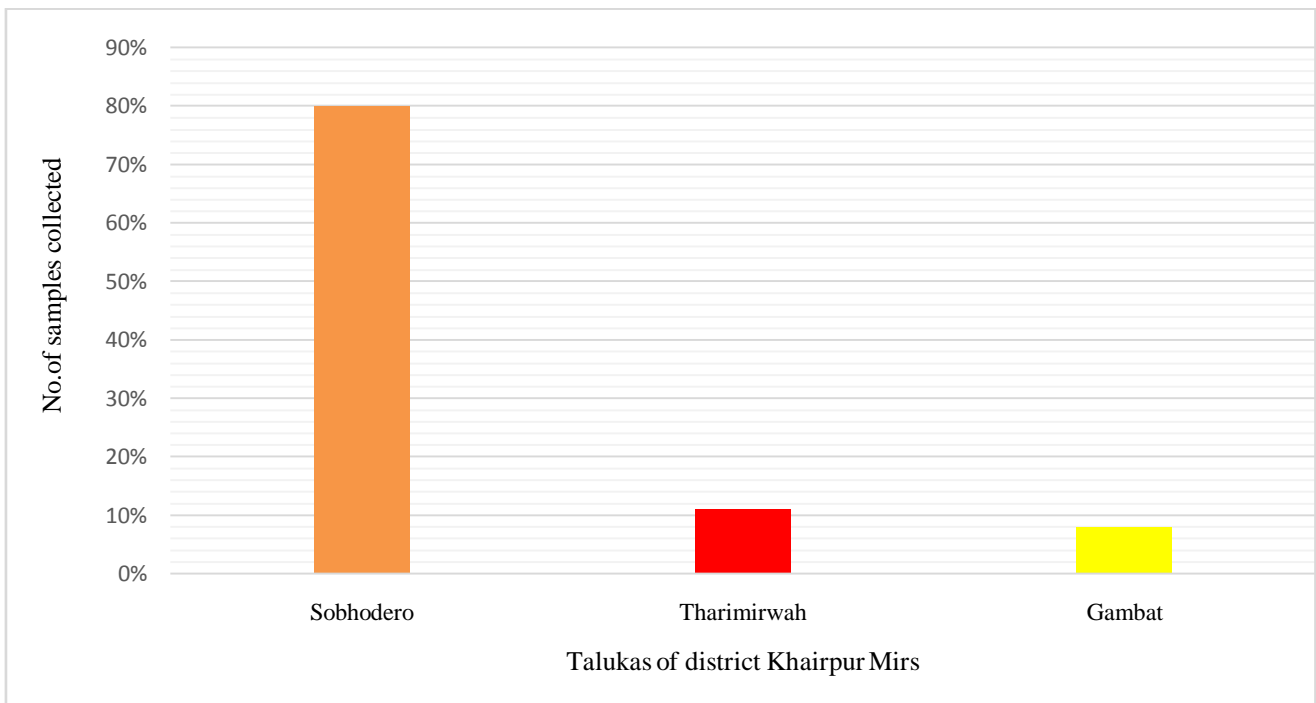
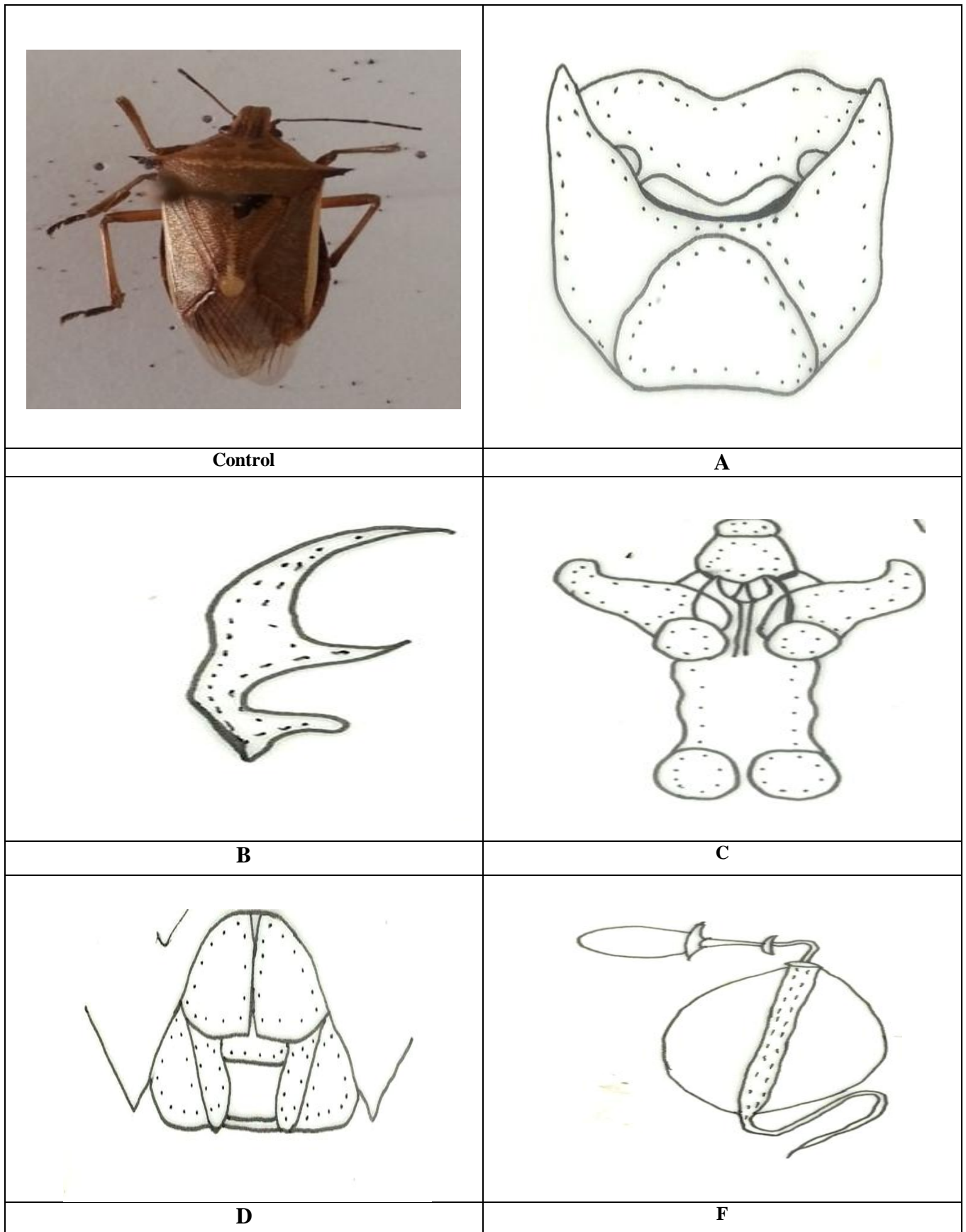


Figure 1. Showing distribution of *Andrallus spinidens*.



Figures 2. A. Pygophore 2 mm, B. Paramere: 3 mm, C. Terminalia: 2 mm, D. Aedeagus: 4 mm, E. Spermatheca: 2 mm.

CONCLUSION

During the presentation of 78 samples were captured and were distributed into three talukas of district Khairpur. The highest number of population was observed in Taluka Sobhodero with 80% followed by Taluka Thairmirwah with 11%, while the lowest population was found in Taluka Gambat with 0.8% respectively.

ACKNOWLEDGMENT

The authors express sincere thanks to the head of the Department of Zoology, Shah Abdul Latif University for the facilities provided to carry out this research work.

REFERENCES

- Afzal, M., & Ahmad, I. (1981). New genus and three new species of Halyini Stal (Heteroptera: Pentatomidae: Pentatominae) from Pakistan. *Pakistan Journal of Zoology*, 13(1-2), 63-72.
- Ahmad, I. (1979). A revision of the check list of Coreoidea and Pentatomidae of the Superfamilies Coreoidea and Pentatomoidea (Heteroptera: Pentatomorpha) from Pakistan with phylogenetic consideration. *Supplement of the Entomological Society of Karachi*, 4(1), 1-113.
- Ahmad, I., Abbasi, Q., & Khan, A.A. (1974). *Generic and Supergeneric Keys with Reference to a Check List of Pentatomid Fauna of Pakistan (Heteroptera: Pentatomoidea), with Notes on Their Distribution and Food Plants*. Entomological Society of Karachi. *Mushi*, 48, 71-78.
- Azim, M.N. (2011). Taxonomic survey of stink bugs (Heteroptera: Pentatomidae) of India. *Halteres*, 3, 1-10.
- Balazuc, J. (1971). Bibliographie des Laboulbéniales (Ascomycètes). *Publications de la Société Linnéenne de Lyon*, 40(5), 134-149.
- Bergroth, E. (1905). Rhynchota neotropica. *Revue d'Entomologie*, 24, 104-112.
- Burmeister, H. (1835) *Handbuch der Entomologie Tome 2 (Abtheil 1)*. Schnabelkerfe, Rhynchota, Enslin, Berlin. I-xii, 1-400.
- Dallas, W.S. (1851). List of the Specimens of Hemipterous Insects in the Collection of the British Museum: Printed by order of the Trustees. 1851-52.
- De Clercq, P. (2000). Predaceous stinkbugs (Pentatomidae: Asopinae) *Heteroptera of Economic Importance, Schaefer CW & Panizzi AR (Eds.)*. CRC Press, Boca Raton, Florida, 2000, 737-789.
- Distant, W. (1902). The Fauna of British India, including Ceylon and Burma. Rhynchota. London, Taylor & Francis, 1-438.
- Ellenrieder, C. (1862). Eerste bijdrage tot de kennis der Hemipteren van den Indischen Archipel. *Nat. Tijdschr. Nederl. Ind*, 24, 130-174.
- Fabricius, J. (1787). Mantissa Insectorum Mantodea & Phasmatodea. *Hafniae, Prost*, 1(20), 348.
- Gapud, V.P. (1991). A generic revision of the subfamily Asopinae, with consideration of its phylogenetic position in the family Pentatomidae and superfamily Pentatomoidea (Hemiptera-Heteroptera). Parts I and II. *Philippine Entomologist*, 8, 865-961.
- Manley, G. (1982). Biology and life history of the rice field predator *Andrallus spinidens* F. (Hemiptera: Pentatomidae). *Entomological News*, 93(1), 19-24.
- Mcpherson, J.E. (1982). The Pentatomoidea (Hemiptera) of northeastern North America with emphasis on the fauna of Illinois: SIU Press. 1-240.
- Mohaghegh, J., & Najafi, I. (2003). Predation capacity of *Andrallus spinidens* (F.) (Het.: Entomidae) on naranga aenescens moore (Lep.: Noctuidae) under semi-field and field conditions. *Applied Entomology and Phytopathology*, 1(71), 57-68.
- Nageswara Rao, V. (1965). *Andrallus (Audineta) spinidens* Fabr., as predator on rice pests. *Oryza*, 2, 179-181.
- Najafi-Navaee, A., Saeb, H., & Osco, T. (1998). *Biology and ecology of Andrallus spinidens* F. As the predator of rice, cotton and maize pests. Paper presented at the 13th Iranian Plant Protection Congress, Karaj, Iran. 1-49.
- Rana, N.A. (1985). Aspects morphology and taxonomy of some true bugs (Antestiini, Asopini, Eysarcorini and Fentatomini) of the subfamily pentatominae (Insecta: Heteroptera: pentatomi) of pakistan with their bearing on classification. University of Karachi, Karachi. 1-344.
- Rider, D. (2013). Pentatomidae Home Page (Online). North Dakota State University. <http://www.ndsu.nodak.edu/ndsu/rider/Pentatomoidea/acknowledgments.htm>
- Rider, D. (2014). Pentatomoidea Home Page, North Dakota State University, Fargo.
- Schaefer, C.W. (1968). The homologies of the female genitalia in the Pentatomoidea (Hemiptera-Heteroptera). *Journal of the New York Entomological Society*, 87-91.
- Schouteden, H. (1907). Family Pentatomidae, Subfamily Asopinae (Amyoteinae). *Genera Insectorum*, 52, 1-82.
- Stal, C. (1867). Bidrag till Reduviidernas kannedom. *Ofversigt af Kungliga Vetenskapsakademiens Forhandlingar*, 23, 235-302.
- Westwood, J.O. 1837. In: Hope, F. W. ed. A Catalogue of Hemiptera in the Collection of the Rev. F.W. Hope, M.A. with Short Latin Diagnoses of the New Species. *London, Journal of Bridgewater*. 1-46.