



Research Article

Records of Genus *Chaetocnema* (Alticini: Galerucinae: Chrysomelidae) from Sindh, Pakistan

Sohail Ahmed Talpur¹, Imran Khatri^{1*}, Maqsood Anwar Rustamani¹ and Zubair Ahmed²

¹Department of Entomology, Sindh Agriculture University Tandojam, Pakistan; ²Department of Zoology, Federal Urdu University of Arts, Science and Technology, Karachi City, Sindh, Pakistan.

Abstract | The study was conducted on genus *Chaetocnema* Stephens, 183, specimens were collected from various regions of Sindh, Pakistan, in total three species of the genus are described; their habitus images and male genitalia is provided; *Chaetocnema belli* Jacoby, 1904, *Chaetocnema concinnicollis* Baly, 1874 and *Chaetocnema pusaensis* (Maulik, 1926). Distributioanl map for each species is also provided.

Received | August 24, 2021; **Accepted** | January 22, 2022; **Published** | June 28, 2022

***Correspondence** | Imran Khatri, Department of Entomology, Sindh Agriculture University Tandojam, Pakistan; **Email:** imrankhatri.agri@gmail.com

Citation | Talpur, S.A., I. Khatri, M.A. Rustamani and Z. Ahmed. 2022. Records of Genus *Chaetocnema* (Alticini: Galerucinae: Chrysomelidae) from Sindh, Pakistan. *Pakistan Journal of Agricultural Research*, 35(2): 388-393.

DOI | <https://dx.doi.org/10.17582/journal.pjar/2022/35.2.388.393>

Keywords | Leaf beetles, Galerucinae, Alticini, Flea beetles, *Chaetocnema*



Copyright: 2022 by the authors. Licensee ResearchersLinks Ltd, England, UK.

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Introduction

Members of genus *Chaetocnema* Stephens, 1831 are commonly known as flea beetles and are ranked under subfamily Galerucinae, tribe Alticini Newman, 1835, these are cosmopolitan, about 500 species are described Worldwide (Özdikmen 2021), from Oriental region 76 species are described Konstantinov *et al.* (2011). Several authors revised Oriental species of this genus (White, 1996; Biondi, 2001; Konstantinov *et al.*, 2011; Ruan *et al.*, 2019). Due to homoplasy and symplesiomorphy of external morphology the classification system remained unstable, later taxonomists included study of genitalia (Kasap and Crowson, 1979; Mann and Crowson, 1983; Suzuki, 1988). For the diagnosis at species level aedeagal morphology haven been useful as compared

to the spermatheca.

Type species of the genus *Chaetocnema* was not designated by Stephens (1831: 325) he included six species in his new genus (Özdikmen 2021).

Flea beetles mostly feed on leaves, very few live in leaf litter, pupation of most of the species take place in soil (Medvedev, 1997). Some species are well known pests of agricultural plants (Kryzhanovskij, 1974) including; cereal crops, cultivated Cruciferae, flax beat horse-radish, strawberry, buckwheat and sorrel (Smarods and Liepa, 1956; Palij, 1958; Pütele, 1960, 1970a, b, 1975, 1984; Ozols, 1963). As the review of literature shows that no work has been done on this genus from this region it is therefore, present study is designed.

Materials and Methods

Specimen collection sites

Collection was made at various important sites of Sindh province.

Method of collection

Collection was made through hand net for direct sampling and also the light trap installed on various sites of Sindh to study maximum number of species.

Methods of killing and preserving

Potassium cyanide was used for killing bottles, legs were properly settled and specimen was labelled properly.

Method of imaging

For quality images staking method was utilized and several mages were captured with the help of DSLR camera fitted on rail, for staking the software control ZP was used.

Methods of identification

For identification regional keys (Mualik, 1926) and miscellaneous literature were followed.

Method of preparing distributional map

Maps were prepared on google earth online.

Method of preparing genitalia

To study male genitalia, it is necessary to perform maceration with the help of 10% KOH for overnight, washed and put in glycerin for further study.

Results and Discussion

Genus Chaetocnema Stephens, 1831

Type species: *Galeruca aridella* Paykull, 1799 (Add generic characters here)

characteristics define in original description for the diagnosis include, prominent head, antennae 11 segmented and jointed, stout legs, tibia simple anteriorly, broad elytra, femora posteriorly very stout, tarsi very small.

Chaetocnema belli Jacoby, 1904 (Plate 1, Figure 1)

Description: Body colour blackish brown or golden brown. Eye colour light brown. Abdominal segment colour dark brown. Scutellum colour dark brown. Body shape ovate. Head blackish brown. Head punctuation

present; or course. Head vertical area rough. Vertex punctuated; or normal. Eyes shape convex. Pronotum narrower than elytron. Pronotum laterally not toothed. Pronotum side margined. Pronotum appearance shiny. Pronotum margin bordered posteriorly. Mouth directed downwards (hypognathous). Hairs on clypeus fine hairs sparsely covered. Hairs on labrum fine and sparsely covered. Antennal color brown. Antenna filiform. Antenna Antenal serration present. Antenal serration present. Antenal first segment club shaped. Antenna inserted separated by frons. Antenal distal segment longer than broad. Scutellum convex. Scutellum appearance shiny. Scutellum shape weakly triangular; or very small. Scutellum fine hairs not present. Elytra punctures present or aligned or punctuation of wings in parallel rows. Elytra colour blackish brown. Prothorax size broader than long. Prothorax punctuation fine or dense. Posterior femur strongly swollen. Tarsal claw bifid. Third tarsal segment emarginated. Aedeagus apex dorsally obtuse. Aedeagus dorsally straight. Gonopore round or below the apex. Aedeagus laterally curved moderately.

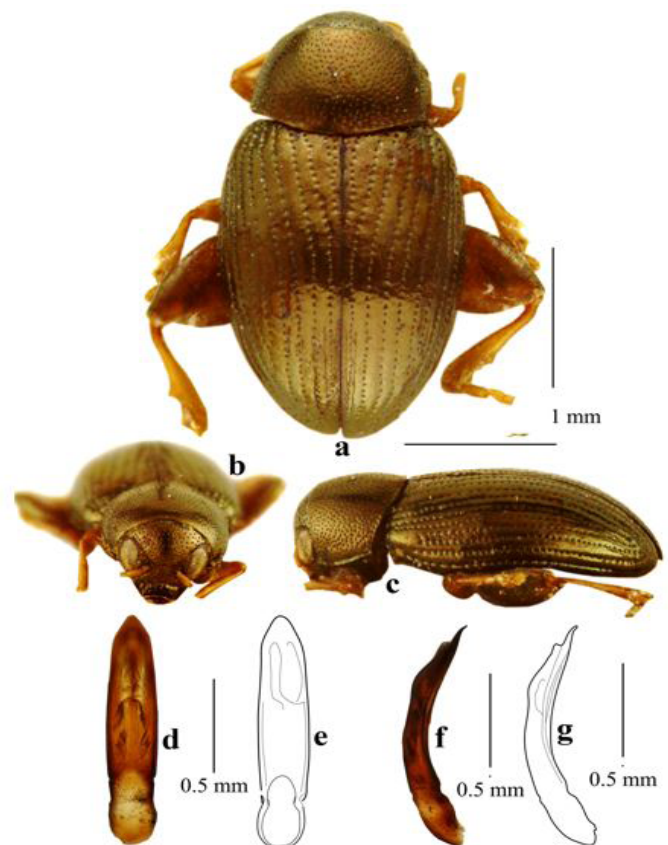


Plate 1: *Chaetocnema belli* Jacoby, 1904.

(a) Habitus dorsal view (b) Habitus front view (c) Habitus lateral view (d, e) Aedeagus dorsal view (f, g) Aedeagus lateral view.

Measurement (mm)

Chaetocnema belli Jacoby, 1904, total length 2.9,

forewing length 2.02, pronotum width 1.08, pronotum length 0.76, aedeagus length 1.07.

Material examined

Chaetocnema belli Jacoby, 1904, 2♂, 2♀, PAKISTAN, Sindh Province, Tharparkar District, Mithi environs, 03.VII.2016, Sohail Ahmed Talpur leg., 24°46'55.22"N, 69°46'6.20"E, 138 ft. Pakistan, Sindh Province, Umer Kot District, Umer Kot environs, 09.VII.2016, Sohail Ahmed Talpur leg., 25°24'2.43"N, 69°37'19.36"E, 43 ft.



Figure 1: Distributional map of *Chaetocnema belli* Jacoby, 1904.

Chaetocnema concinnicollis (Baly, 1874) (Plate 2, Figure 2)

Description: Body colour blackish brown. Eye colour black. Abdominal segment colour black. Scutellum colour blackish brown. Body shape ovate. Head dark brown. Head punctuation sparse; or fine. Head vertical area rough. Vertex fine; or punctuated. Eyes shape strongly convex. Pronotum narrower than elytron. Punctuation on pronotum sparse and semi-visible. Pronotum laterally not toothed. Pronotum side margined. Pronotum appearance shiny. Pronotum depression not present. Pronotum margin bordered posteriorly. Mouth directed downwards (hypognathous). Hairs on clypeus fine hairs sparsely covered. Hairs on labrum fine and sparsely covered. Antennal color light brown to brown. Antenna

filiform. Antenna size extending beyond the mid of elytron. Antennal serration present. Antennal first segment club shaped. Antennal second segment short. Antennal third segment equal to second. Antennal fourth segment shorter than third. Antennal distal segment longer than broad. Scutellum convex or smooth. Scutellum appearance shiny. Scutellum shape weakly triangular. Elytra punctures present and coarse; or aligned. Elytra colour dark brown. Elytra spots not present. Prothorax size broader than long. Prothorax punctuation fine; or sparse. Posterior femur strongly swollen. Posterior tibial spines present. Tarsal claw bifid. Third tarsal segment emarginated. Aedeagus apex dorsally cuspidate or obtuse. Aedeagus dorsally straight. Gonopore at apex or triangular weakly. Aedeagus laterally curved moderately.

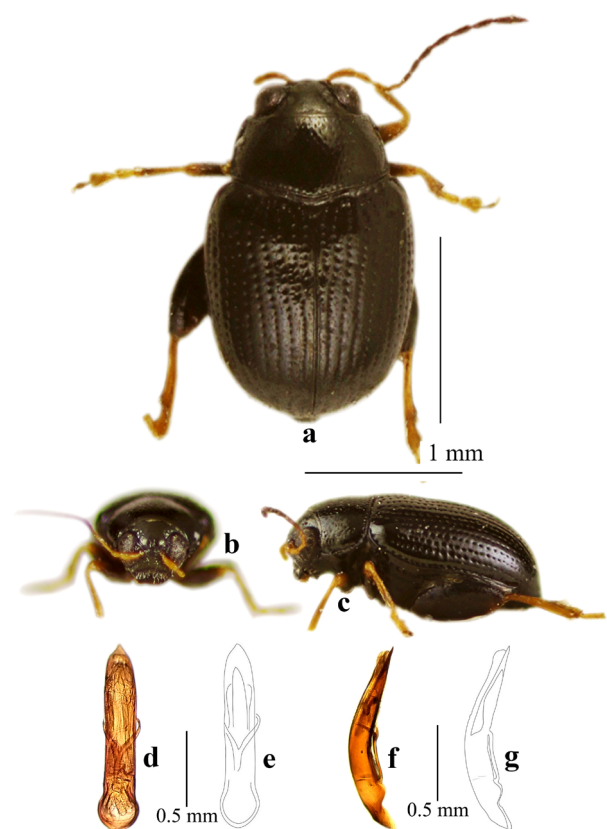


Plate 2: *Chaetocnema concinnicollis* (Baly, 1874).

(a) Habitus dorsal view; (b) Habitus front view; (c) Habitus lateral view; (d, e) Aedeagus dorsal view; (f, g) Aedeagus lateral view.

Measurement (mm)

Chaetocnema concinnicollis (Baly, 1874), total length 1.83, forewing 1.16, pronotum width 0.69, pronotum length 0.45, antennal length 1.6, interocular width 0.22, eyes in cross 0.2, eyes width 0.13, fore tarsal length with claw 0.35, mid tarsal length with claw 0.32, hind tarsal length with claw 0.42, inter antennal width 0.14, aedeagus length 0.97.

Material examined

Chaetocnema concinnicollis (Baly, 1874), 8♂, 21♀, Pakistan, Sindh Province, Tando Muhammad Khan District, Shaikh Bhirkio environs, 18.VII.2015, Sohail Ahmed Talpur leg., 25°17'20.61"N, 68°38'24.08"E, 36 ft. Pakistan, Sindh Province, Tando Muhammad Khan District, Tando Muhammad Khan environs, 04.VII.2017, Sohail Ahmed Talpur leg., 25° 7'44.64"N, 68°32'39.21"E, 36 ft. Pakistan, Sindh Province, Hyderabad District, Tando Jam environs, 02.VII.2016, Sohail Ahmed Talpur leg., 25°25'40.56"N, 68°32'1.21"E, 75 ft. Pakistan, Sindh Province, Tando Allahyar District, Tando Allahyar environs, 04.VII.2017, Sohail Ahmed Talpur leg., 25°27'33.00"N, 68°43'50.58"E, 76 ft.

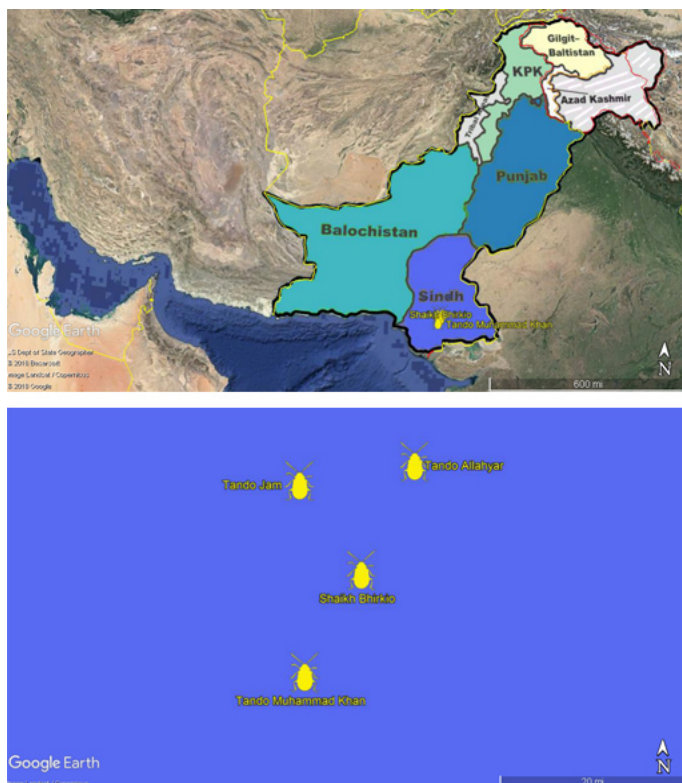


Figure 2: Distributional map of *Chaetocnema concinnicollis* (Baly, 1874).

Chaetocnema pusaensis (Maulik, 1926) (Plate 3, Figure 3)

Description: Body colour metallic greenish brown or greenish black. Eye colour dark brown. Abdominal segment colour black. Scutellum colour greenish black. Body shape ovate. Head greenish black. Head punctuation present; or course. Head vertical area rough. Vertex punctuated. Eyes shape convex. Pronotum patches not present. Pronotum narrower than elytron. Pronotum laterally not toothed. Pronotum side margined. Pronotum appearance shiny. Pronotum depressed not present. Pronotum margin

bordered posteriorly. Mouth directed downwards (hypognathous). Hairs on clypeus fine hairs sparsely covered. Hairs on labrum fine and sparsely covered. Antennal color light brown to brown. Antenna filiform. Antenna size extending beyond the mid of elytron. Antennal serration present. Antennal first segment club shaped. Antennal second segment long. Antennal third segment equal to fourth. Antennal fifth segment equal to fourth. Antenna inserted separated by frons; or not closely. Antennal distal segment longer than broad. Scutellum convex; or impunctate. Scutellum appearance shiny. Scutellum shape weakly triangular; or very small. Elytra punctures present and course or Punctuation on wings semi-parallel. Elytra colour greenish black. Elytra spots not present. Prothorax size narrower than elytra basally. Prothorax punctuation course; or dense. Posterior femur strongly swollen. Posterior tibial spines present. Tarsal claw bifid. Third tarsal segment emarginated. Aedeagus apex dorsally cuspidate. Aedeagus dorsally straight. Gonopore at apex; or triangular weakly. Aedeagus laterally curved moderately.

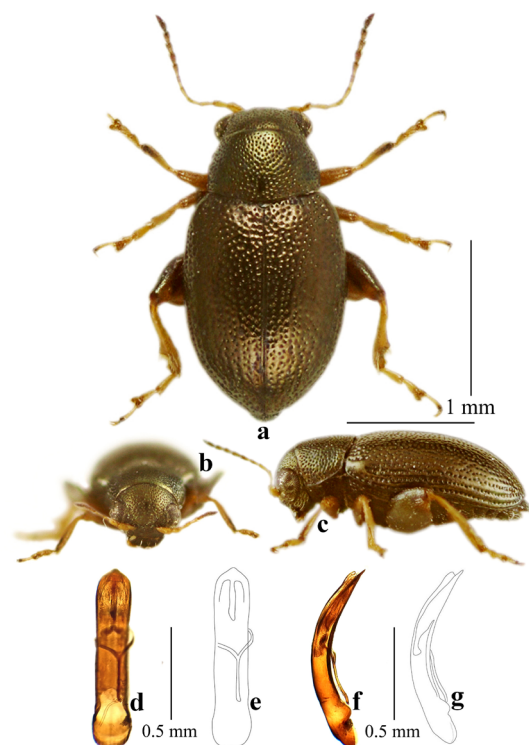


Plate 3: *Chaetocnema pusaensis* (Maulik, 1926).

(a) Habitus dorsal view; (b) Habitus front view; (c) Habitus lateral view; (d, e) Aedeagus dorsal view; (f, g) Aedeagus lateral view.

Measurement (mm)

Chaetocnema pusaensis (Maulik, 1926), total length 2.17, forewing 1.78, pronotum width 0.74, pronotum length 0.29, interocular width 0.42, eyes in cross 0.28, eyes width 0.14, aedeagus length 1.02.

Material examined

Chaetocnema pusaensis (Maulik, 1926), 12♂, 27♀, Pakistan, Sindh Province, Tando Muhammad Khan District, Shaikh Bhirkio, environs, 18.VII.2016, Sohail Ahmed Talpur leg., 25°17'20.61"N, 68°38'24.08"E, 36 ft. Pakistan, Sindh Province, Tando Muhammad Khan District, Tando Muhammad Khan environs, 04.VII.2017, Sohail Ahmed Talpur leg., 25° 7'44.64"N, 68°32'39.21"E, 36 ft. Pakistan, Sindh Province, Hyderabad District, Tando Jam environs, 02.VII.2016, Sohail Ahmed Talpur leg., 25°25'40.56"N, 68°32'1.21"E, 75 ft. Pakistan, Sindh Province, Tando Allahyar District, Tando Allahyar environs, 04.VII.2017, Sohail Ahmed Talpur leg., 25°27'33.00"N, 68°43'50.58"E, 76 ft.



Figure 3: Distributional map of *Chaetocnema pusaensis* (Maulik, 1926).

There are several distinguishing characteristics among all three species of genus *Chaetocnema* Stephens, 1831. Pronotum in *C. belli* Jacoby, 1904 is much wider than *C. concinnicollis* Baly, 1874 and *C. pusaensis* (Maulik, 1926). Body colour in *C. belli* and *C. concinnicollis* is Blackish Brown and in *C. pusaensis* metallic green. Eyes colour in *C. belli* and *C. pusaensis* and in *C. concinnicollis* it is black. Head punctuation course in *C. belli* and *C. pusaensis* and sparse and fine in *C. concinnicollis*. Eyes shape convex in *C. belli* and *C. pusaensis*, strongly convex in *C. concinnicollis*. Punctuation on pronotum

varies in all three species fine and dense *C. belli*, sparse and semi-visible *C. concinnicollis*, course and dense in *C. pusaensis*. Antenal second segment short in *C. concinnicollis* long *C. pusaensis*. Antenal third segment equal to second *C. concinnicollis*, equal to fourth *C. pusaensis*. Colour of elytra blackish brown in *C. belli*, dark brown *C. concinnicollis* and greenish black *C. pusaensis*. Prothorax broader than long in *C. belli* and *C. concinnicollis* narrower than elytra *C. pusaensis*. Punctuation in prothorax varies in all three species fine and dense in *C. belli* find and sparse in *C. concinnicollis* and course and dense *C. pusaensis*. Apex of the aedeagus varies dorsally in all species, obtuse *C. belli*, cuspidate or obtuse *C. concinnicollis*, cuspidate in *C. pusaensis*. Gonopore in *C. belli* is round and below the apex where as in *C. concinnicollis* and *C. pusaensis* at apex and triangular weakly.

Conclusions and Recommendations

Total three species of genus *Chaetocnema* Stephens, 1831 are discovered and presented.

Novelty Statement

Genus *Chaetocnema* reported for the first time from Sindh on vegetables with illustrations, regional keys and distributional maps.

Author's Contribution

Sohail Ahmed Talpur: Collected the specimen, imaging and staking of specimens.

Imran Khatri: Wrote the draft.

Maqsood Anwar Rustamani: Edited the manuscript.

Zubair Ahmed: Further IDs confirmation.

Conflict of interest

The authors have declared no conflict of interest.

References

- Biondi, M., 2001. Revision of the species of *Chaetocnema* from Madagascar (Coleoptera Chrysomelidae Alticinae). Eur. J. Ent., 98: 233-248. <https://doi.org/10.14411/eje.2001.040>
- Kasap, H. and R.A. Crowson. 1979. The male reproductive organs of Bruchidae and Chrysomelidae (Coleoptera). Turk. J. Ent., 3: 199-216.
- Konstantinov, A.S., A. Baselga, V.V. Grebennikov,

- J. Prena and S.W. Lingalfelter. 2011. Revision of the Palearctic *Chaetocnema* species. (Coleoptera: Chrysomelidae: Galerucinae: Alticini). Pensoft, Sofia, pp. 363.
- Kryzhanovskij, O.L., 1974. Insects and ticks the pests of agricultural cultures. II. Coleoptera. Leningrad, Nauka: pp. 1-336. (in Russian).
- Mann, J.S. and R.A. Crowson. 1983. On the internal male reproductive organs and their taxonomic significance in the leaf beetles (Coleoptera: Chrysomelidae). Ent. Gene, 9: 75-99. <https://doi.org/10.1127/entom.gen/9/1983/75>
- Maulik, S., 1926. The fauna of British India including Ceylon and Burma: Coleoptera: Chrysomelidae. Volume 3. Chrysomelinae and Halticinae: Taylor and Francis, London.
- Medvedev L.N., 1997. New aberrant genus of Alticinae (Coleoptera, Chrysomelidae) the representative of ecological group of detritobionts. Zool. J., 76(10): 1218-1220. (in Russian).
- Özdikmen, H., 2021. A review: A new subgeneric arrangement of the genus *Chaetocnema* Stephens (Chrysomelidae: Galerucinae: Alticini) with new subgenera based on spermathecal structures. Mun. Ent. Zool., 16(1): 41-105.
- Ozols, E., 1963. Agricultural entomology. 2 ed. Rīga, Latvian state publishing house: pp. 1-512. (in Latvian).
- Palij, V.F., 1958. On the fauna and biocenology of flea beetles of Latvia (Coleoptera, Chrysomelidae, Halticinae). Proc. Inst. Biol. Latv. SSR Acad. Sci., 5: 69-89. (in Russian).
- Pūtele, V., 1958. Some observations about buckle species in Latvia. PSR. LLA Raksti., 7: 83-92. (in Latvian, Russian summary)
- Pūtele, V., 1960. *Phyllotreta* Foudras ģints spradži Latvijas PSR. Latvij. Entomol., 1: 34-42. (in Latvian).
- Pūtele, V., 1970a. The flea beetles *Chaetocnema* Steph in Latvian SSR. The Materi. 7th Balt. Pl. Protec. Conf., Jelg., 1: 20-25. (in Russian).
- Pūtele, V., 1970b. Research on the fauna and ecology of the flea beetles (Coleoptera, Chrysomelidae, Halticinae) of the Latvian SSR. Abstract of the doctoral thesis in Biological Sciences. Jelg. Latv. Min. Agric., pp. 1-36. (in Russian).
- Pūtele, V., 1971a. Little-known flea beetles in Latvia. Artic. Latv. Acad. Agric., 42: 76-86. (in Latvian, Russian summary).
- Pūtele, V., 1971b. The flea beetles *Haltica* Fabr. and *Chalcoides* Foudr. in Latvian SSR. Artic. Latv. Acad. Agric., 42: 87-94. (in Latvian, Russian summary).
- Pūtele, V., 1975. Flea beetles as pests to Poaceae in the Latvian SSR. Artic. Latv. Acad. Agric., 84: 42-48. (in Latvian).
- Pūtele, V.O., 1984. Leaf-beetles pests of tree cultures in the Slitere State Nature Reserve. Artic. Latv. Acad. Agric., 213: 9-15. (in Russian).
- Ruan, Y., Yang, X., Konstantinov, A.S., Prathapan, K.D. and Zhang, M., 2019. Revision of the oriental *Chaetocnema* species (Coleoptera, Chrysomelidae, Galerucinae, Alticini). Zootaxa, 4699(1): 001-206. <https://doi.org/10.11646/zootaxa.4699.1.1>
- Smarods, J. and I. Liepa. 1956. Vegetable pests and diseases. Riga, Latvian State Publishing House. pp. 1-407. (in Latvian).
- Stephens, J.F., 1831. Illustration of British entomology, a synopsis of indigenous insects. Mandibulata. Baldwin and Cradock, London, 4: 366.
- Suzuki, K., 1988. Comparative morphology of the internal reproductive system of Chrysomelidae (Coleoptera). In: Jolivet P, Petitpierre E, Hsiao TH (Eds) Biology of Chrysomelidae. Kluwer Academic Publishers, Dordrecht, Boston and London, pp. 317-355. https://doi.org/10.1007/978-94-009-3105-3_19
- White, R.E., 1996. A revision of the genus *Chaetocnema* of America north of Mexico (Coleoptera: Chrysomelidae). Contr. Am. Entomol. Inst., 29(1): 1-158.