

A CONTRIBUTION TO THE KNOWLEDGE OF IRANIAN STAPHYLINIDAE (COLEOPTERA: STAPHYLINOIDEA)

NAJMEH SAMIN¹, HONGZHANG ZHOU², SOHRAB IMANI³ and JINOOS RASTEGAR⁴

¹ *Young Researchers Club, Science and Research Branch, Islamic Azad University, Tehran, Iran*

² *Institute of Zoology, Chinese Academy of Sciences, Chaoyang, Beijing 100101, China*

³ *Department of Entomology, Science and Research Branch, Islamic Azad University, Tehran, Iran*

⁴ *Department of Entomology, Garmsar Branch, Islamic Azad University, Semnan, Iran*

Abstract - In this study, 94 staphylinid species of 59 genera belonging to four groups (omaliin, tachyporin, oxyteline and staphylinin) and 13 subfamilies (including, Dasycerinae, Omaliinae, Proteininae, Pselaphinae, Oxytelinae, Piestinae, Oxyporinae, Steninae, Paederinae, Staphylininae, Phloeocharinae, Tachyporinae and Aleocharinae) were collected from different regions of Iran.

Key words: Coleoptera, rove beetles, Staphylinidae, fauna, Iran

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INTRODUCTION

The family Staphylinidae, with over 46,000 species in thousands of genera, is the second largest family of beetles after the Curculionidae (Caterino et al., 2005). Family Staphylinidae is divided into 4 groups including Omaliine, Tachyporine, Oxyteline and Staphylinine, according to Lawrence and Newton (1982). This family occupies almost all moist environments throughout the world. Because none of them is truly aquatic, they do not live in open waters; although winged adults may be skimmed from the sea surface far from land, their presence is due to misadventure but attests to their dispersive ability. They live in leaf litter of woodland and forest floors and grasslands (Paulian, 1941; Moore and Legner, 1976; Newton et al., 2000). Several species live only on seashores, and many which are specialized to existence in the nests of social insects, live in mushrooms. Many inhabit caves, underground burrows of vertebrate animals, and smaller soil cavities, even burrows that they (a few of them) excavate. The adults and larvae of a few

are associated with living flowers. Others climb on plants, especially at night, and hunt for prey. A few seem to live with terrestrial snails. Their distribution in arid environments is restricted to moist microhabitats (Blackwelder, 1943; Seevers, 1957; Newton, 1990). Most rove beetles are predators of insects and other kinds of invertebrates, living in forest leaf litter and similar kinds of decaying plant matter. They are also commonly found under stones, and around freshwater margins. Actually there are numerous species, e.g. some genera of Pselaphinae, Aleocharinae, Scydmaeninae species, which have adapted to living as inquilines in ant and termite colonies, and some live in mutualistic relationships with mammals where they eat fleas and other parasites, thereby benefiting the host. A few species are parasitoids of other insects, particularly of certain fly pupae. Some staphylinids have been shown to feed occasionally on slugs and snails, although apparently they are not specialized to do so as are Cychrini (Coleoptera: Carabidae), nor have slugs and snails been shown to be an important part of the diet as in some Silphinae

(Coleoptera: Silphidae) (Klimazewski, 2000; Newton et al., 2001; Löbl and Smetana, 2004; Assing and Schulke, 2006).

The fauna of Iranian Staphylinidae is very diverse but has not been studied much so far (Sakenin et al., 2008a, b, c; Ghahari et al., 2009a, b; Samin et al., 2011a, b). In total 594 species and subspecies in 150 genera belonging to 13 subfamilies of Staphylinidae from Iran have been identified so far (Anlas and Newton, 2010) but the fauna of Iran is more diverse than the mentioned record. This family is studied in this paper on the basis of 4 taxonomic groups (Omaliine, Oxyteline, Staphylinine, Tachyporine).

MATERIALS AND METHODS

The specimens were collected mainly by sweeping net, light traps and aspirator from different regions of Iran. Although almost all the material was collected by the first author and his many students and colleagues, some insect collections of different branches of the Islamic Azad University were used too. Information concerning specific name, description, locality and date of collection, place/field on which the species were collected and number of species is given. Classification and nomenclature suggested by Newton and Thayer (1992), Klimaszewski (2000), Herman (2001) and Löbl and Smetana (2004) have been followed in this study. The recorded insect genera have been listed in phylogenetic order in each subfamily and species are sorted alphabetically.

RESULTS

A total of 94 species of 59 genera and 13 subfamilies of the Omaliine, Tachyporine, Oxyteline and Staphylinine groups were collected. The list of species is given below.

Family Staphylinidae Latreille, 1802

I. Omaliine Group

Subfamily Dasycerinae Reitter, 1887

Genus *Dasycerus* Brongniart, 1800

Dasycerus crenatus Motschulsky, 1839

Material: East Azarbaijan province, Maragheh, 3 specimens, June 2008.

Subfamily Omaliinae MacLeay, 1825

Tribe Anthophagini Thomson, 1859

Genus *Anthobium* Leach, 1819

Anthobium fuscum (Erichson, 1839)

Material: Isfahan province, Khomeynishahr, 1 specimen, August 2009.

Genus *Deliphrosoma* Reitter, 1909

Deliphrosoma prolongatum (Rottenberg, 1873)

Material: East Azerbaijan province, Khomarloo, 2 specimens, July 2006.

Genus *Lesteva* Latreille, 1797

Lesteva longoelytrata (Goeze, 1777)

Material: West Azerbaijan province, Naghadeh, 1 specimen, September 2007.

Tribe Coryphiini Jakobson, 1908

Genus *Coryphium* Stephens, 1834

Coryphium uludaghense Fagel, 1971

Material: Semnan province, Shahrud, 1 specimen, June 2005.

Tribe Eusphalerini Hatch, 1957

Genus *Eusphalerum* Kraatz, 1857

Eusphalerum primulae (Stephens, 1834)

Material: Mazandaran province, Joibar, 1 specimen, April 2005.

Eusphalerum sorbi (Gyllenhal, 1810)

Material: Guilan province, Lahijan, 1 specimen, May 2006.

Tribe Omaliini MacLeay, 1825

Genus *Omalium* Gravenhorst, 1802

Omalium caesum Gravenhorst, 1806

Material: Golestan province, Gonbad, 1 specimen, July 2006.

Omalium rivulare (Paykull, 1789)

Material: Semnan province, Shahmirzad, 2 specimens, October 2007.

Subfamily Proteininae Erichson, 1839
 Tribe Proteinini Erichson, 1839
 Genus *Proteinus* Latreille, 1797
Proteinus brachypterus (Fabricius, 1792)
 Material: Khorasan province, Kashmar, 1 specimen, June 2005.

Subfamily Pselaphinae Latreille, 1802
 Supertribe Batrisitae Reitter, 1882
 Tribe Amauropini Jeannel, 1948
 Genus *Bergrothia* Reitter, 1884
Bergrothia saulcyi (Reitter, 1877)
 Material: Hamadan province, Nahavand, 2 specimens, August 2006.

Tribe Batrisini Reitter, 1882
 Genus *Batrisodes* Reitter, 1882
Batrisodes oculatus (Aubè, 1833)
 Material: Mazandaran province, Savadkooh, 2 specimens, October 2006.

Supertribe Clavigeritae Leach, 1815
 Tribe Clavigerini Leach, 1815
 Genus *Claviger* Preyssler, 1790
Claviger testaceus Preyssler, 1790
 Material: Markazi province, Arak, 1 specimen, September 2007.

Supertribe Euplectitae Streubel, 1839
 Tribe Euplectini Streubel, 1839
 Genus *Euplectus* Leach, 1817
Euplectus sanguineus Denny, 1825
 Material: West Azarbaijan province, Ourmieh, 4 specimens, September 2008.

Tribe Trichonychini Reitter, 1882
 Genus *Biblopectus* Reitter, 1882
Biblopectus pusillus (Denny, 1825)
 Material: Guilan province, Lahijan, 2 specimens, August 2006.

Supertribe Goniaceritae Reitter, 1882
 Tribe Brachyglutini Raffray, 1904
 Genus *Brachygluta* Thomson, 1859
Brachygluta transversalis (Schaum, 1859)

Material: Khorasan province, Bojnord, 2 specimens, July 2007.

Tribe Bythinini Raffray, 1890
 Genus *Bryaxis* Kugelann, 1794
Bryaxis longipalpis (Motschulsky, 1835)
 Material: Semnan province, Shahrud, 2 specimens, April 2007.

Tribe Tychini Raffray, 1904
 Genus *Tychus* Leach, 1817
Tychus niger (Paykull, 1800)
 Material: Mazandaran province, Behshahr, 2 specimens, July 2008.

Supertribe Pselaphitae Latreille, 1802
 Tribe Ctenistini C. É. Blanchard, 1845
 Genus *Sognorus* Reitter, 1882
Sognorus calcaratus (Baudi di Selve, 1870)
 Material: Mazandaran province, Sari, 2 specimens, April 2007.

II. Oxyteline Group
 Subfamily Oxytelinae Fleming, 1821
 Tribe Oxytelini Thomson, 1858
 Genus *Anotylus* Thomson, 1859
Anotylus speculifrons (Kraatz, 1857)
 Material: Isfahan province, Isfahan, 5 specimens, April 2008.

Anotylus tetracaratus (Block, 1799)
 Material: Guilan province, Chaboksar, 6 specimens, August 2006.

Genus *Oxytelus* Gravenhorst, 1802
Oxytelus sculptus Gravenhorst, 1806
 Material: Hamadan province, Malayer, 1 specimen, May 2005.

Genus *Platystethus* Mannerheim, 1830
Platystethus spinosus Erichson, 1840
 Material: Kordestan province: Bijar, 31 specimens, August 2007.

Genus *Bledius* Leach, 1819
Bledius vitulus Erichson, 1840

Material: Golestan province, Gorgan, 2 specimens, May 2006.

Genus *Carpelimus* Leach, 1819

Carpelimus obesus (Kiesenwetter, 1844)

Material: Fars province, Shiraz, 2 specimens, June 2006.

Carpelimus pusillus (Gravenhorst, 1802)

Material: Kordestan province: Sanandaj, 2 specimens, April 2008.

Genus *Ochtheophilus* Mulsanat & Rey, 1856

Ochtheophilus emarginatus (Fauvel, 1871)

Material: Fars province: Kazeroon, 2 specimens, June 2007.

Subfamily Piestinae Erichson, 1839

Genus *Siagonium* Kirby & Spence, 1815

Siagonium humerale Germar, 1836

Material: East Azerbaijan province, Maragheh, 1 specimen, September 2005.

III. Staphylinine Group

Subfamily Oxyporinae Fleming, 1821

Genus *Oxyporus* Fabricius, 1775

Oxyporus maxillosus Fabricius, 1793

Material: Golestan province, Gorgan, 5 specimens, May 2009.

Subfamily Steninae MacLeay, 1825

Genus *Stenus* Latreille, 1797

Stenus aceris Stephens, 1833

Material: West Azerbaijan province, Mako, 2 specimens, September 2007.

Comment: *Andrenosoma albibarbe* (Meigen) (Diptera: Asilidae) was collected as the predator of *S. aceris* from Arasbaran.

Stenus biguttatus (Linnaeus, 1758)

Material: Guilan province, Fooman, 4 specimens, September 2008.

Stenus canaliculatus Gyllenhal, 1827

Material: Fars province, Jahrom, 4 specimens, April 2006.

Stenus umbricus Baudi di Selve, 1870

Material: Khuzestan province: Ahwaz, 1 specimen, April 2007.

Stenus solutus Erichson, 1840

Material: Fars province, Shiraz, 3 specimens, May 2008.

Stenus subaeneus Erichson, 1840

Material: Ardabil province, Meshkinshahr, 2 specimens, June 2007.

Comment: *Hoplotriclis pallasii* (Wiedemann) (Diptera: Asilidae) was collected as the predator of *S. subaeneus* from Arasbaran.

Stenus melanopus Marsham, 1802

Material: Khorasan province, Mashhad, 3 specimens, March 2006.

Subfamily Paederinae Fleming, 1821

Tribe Paederini Fleming, 1821

Subtribe Astenina Hatch, 1957

Genus *Astenus* Stephens, 1833

Astenus gracilis (Paykull, 1789)

Material: Guilan province, Lahijan, 1 specimen, May 2008.

Astenus procerus (Gravenhorst, 1806)

Material: Mazandaran province, Sari, 2 specimens, June 2008.

Comment: *Pheidole ordanica* Saulcyi (Hymenoptera: Formicidae) was collected as the predator of *A. procerus* from Lenjan.

Astenus thoracicus (Baudi di Selve, 1857)

Material: Isfahan province, Shahinshahr, 4 specimens, May 2007.

Subtribe Dolicaonina Casey, 1905

Genus *Leptobium* Casey, 1905

Leptobium illyricum (Erichson, 1840)

Material: Khorasan province, Torbat Heydarieh, 3 specimens, October 2006.

Subtribe Lathrobiina Laporte, 1835

Genus *Achenium* Leach, 1819

Achenium levantinum Reitter, 1884

Material: Guilan province, Chaboksar, 3 specimens, June 2006.

Genus *Lathrobium* Gravenhorst, 1802

Lathrobium castaneipenne Kolenati, 1846

Material: Golestan province, Gorgan, 2 specimens, April 2006.

Lathrobium pallidipenne Hochhuth, 1851

Material: Qazvin province, Qazvin, 2 specimens, August 2007.

Comment: *Tolmerus tessellatus* (Loew) (Diptera: Asilidae) was collected as the predator of *L. pallidipenne* from Zanjan.

Genus *Micrillus* Raffray, 1873

Micrillus testaceus (Erichson, 1840)

Material: Sistan & Baluchestan province, Zabol, 2 specimens, April 2006.

Subtribe Medonina Casey, 1905

Genus *Medon* Stephens, 1833

Medon pocoferus (Peyron, 1858)

Material: Kordestan province, Sanandaj, 4 specimens, May 2007.

Genus *Sunius* Stephens, 1829

Sunius melanocephalus (Fabricius, 1793)

Material: Mazandaran province, Qaemshahr, 3 specimens, September 2008.

Subtribe Paederina Fleming, 1821

Genus *Paederus* Fabricius, 1775

Paederus riparius (Linnaeus, 1758)

Material: Semnan province, Shahrud, 6 specimens, May 2008.

Subtribe Scopaeina Mulsant & Rey, 1878

Genus *Scopaeus* Erichson, 1839

Scopaeus debilis Hochhuth, 1851

Material: East Azarbayjan, Maragheh, 3 specimens, October 2005.

Scopaeus laevigatus (Gyllenhal, 1827)

Material: East Azerbaijan province, Arasbaran, 2 specimens, July 2008.

Comment: Two ant species including, *Camponotus xerxes* Forel and *Messor aralocaspius* (Ruzsky) (Hymenoptera: Formicidae) were collected as the predators of *S. laevigatus* from Arasbaran.

Subtribe Stilicina Casey, 1905

Genus *Rugilus* Leach, 1819

Rugilus orbiculatus (Paykull, 1789)

Material: Semnan province, Garmsar, 4 specimens, April 2006.

Tribe Pinophilini Nordmann, 1837

Subtribe Procirrina Bernhauer & Schubert, 1912

Genus *Procirrus* Latreille, 1829

Procirrus saulcyi Fauvel, 1873

Material: Chaharmahal and Bakhtiari province, Shahrekord, 1 specimen, September 2007.

Subfamily Staphylininae Latreille, 1802

Tribe Othiini Thomson, 1859

Genus *Othius* Stephens, 1829

Othius punctulatus (Goeze, 1777)

Material: Chaharmahal and Bakhtiari province, Shahrekord, 2 specimens, June 2007.

Tribe Staphylinini Latreille, 1802

Subtribe Philonthina Kirby, 1837

Genus *Gabrius* Stephens, 1829

Gabrius exiguus (Nordmann, 1837)

Material: Ardabil province, Moghan, 2 specimens, September 2006.

Gabrius nigrutilus (Gravenhorst, 1802)

Material: Mazandaran province, Neka, 1 specimen, September 2008.

Genus *Neobisnus* Ganglbauer, 1895

Neobisnus prolixus (Erichson, 1840)

Material: Zanjan province, Zanjan, 1 specimen, September 2006.

Genus *Philonthus* Stephens, 1829

Philonthus atratus (Gravenhorst, 1802)

Material: Golestan province, Gorgan, 2 specimens, June 2007.

Philonthus cruentatus (Gmelin, 1790)

Material: Kerman province, Jiroft, 2 specimens, May 2007.

Comment: *Eutolmus rufibarbis* (Meigen) (Diptera: Asilidae) was collected as the predator of *P. cruentatus* from Zanjan.

Philonthus politus (Linnaeus, 1758)

Material: Fars province, Shiraz, 1 specimen, October 2008.

Comment: *Choerades fuliginosa* (Panzer) (Diptera: Asilidae) was collected as the predator of *P. politus* from Shiraz.

Philonthus spinipes Sharp, 1874

Material: Khorasan province, Mashhad, 3 specimens, September 2007.

Philonthus varians (Paykull, 1789)

Material: Tehran province, Shahreyar, 1 specimen, August 2008.

Comment: *Neomochtherus albicans* (Loew) (Diptera: Asilidae) was collected as the predator of *P. varians* from Shahreyar.

Philonthus ventralis (Gravenhorst, 1802)

Material: West Azerbaijan, Ourmieh, 1 specimen, September 2008.

Genus *Remus* Holme, 1837

Remus pruinus (Erichson, 1840)

Material: Golestan province, Gonbad, 2 specimens, April 2006.

Subtribe *Quediina* Kraatz, 1857

Genus *Quedius* Stephens, 1829

Quedius boops tauricus (Nordmann, 1837)

Material: Golestan province, Gonbad, 1 specimen, September 2006.

Quedius coxalis Kraatz, 1858

Material: Golestan province, Minoodasht, 3 specimens, July 2005.

Quedius cruentus (Olivier, 1795)

Material: Ardabil province, Germy, 1 specimen, September 2007.

Quedius fulgidus (Fabricius, 1793)

Material: Isfahan province, Shahreza, 1 specimen, August 2008.

Quedius nivicola Kiesenwetter, 1858

Material: Tehran province, Varamin, 1 specimen, August 2007.

Quedius ochropterus Erichson, 1840

Material: Isfahan province, Najaf-Abad, 2 specimens, July 2005.

Comment: Two ground beetles including, *Nebria* (*Nebria*) *hemprichi* Klug and *Pterostichus* (*Platysma*) *niger* (Schaller) (Coleoptera: Carabidae) were collected as the predators of *Q. ochropterus* from Isfahan.

Quedius umbrinus Erichson, 1839

Material: East Azarbaijan province, Arasbaran, 2 specimens, August 2007.

Subtribe *Staphylinina* Latreille, 1802

Genus *Creophilus* Leach, 1819

Creophilus maxillosus (Linnaeus, 1758)

Material: Zanjan province, Zanjan, 5 specimens, September 2008.

Genus *Ocypus* Leach, 1819

Ocypus brunnipes (Fabricius, 1781)

Material: Mazandaran province, Savadkooh, 1 specimen, September 2008.

Ocypus milleri Quedenfeldt, 1882

Material: Zanjan province, Zanjan, 3 specimens, September 2006.

Ocypus nitens (Schrank, 1781)

Material: Guilan province, Rasht, 4 specimens, August 2006.

Ocypus pullus Hochhuth, 1849

Material: Ardabil province, Meshkinshahr, 2 specimens, September 2005.

Genus *Staphylinus* Linnaeus, 1758

Staphylinus erythropterus Linnaeus, 1758

Material: Guilan province, Roodsar, 4 specimens, August 2007.

Genus *Tasgius* Stephens, 1829

Tasgius globulifer (Geoffroy, 1785)

Material: Mazandaran province, Amol, 4 specimens, September 2007.

Tasgius morsitans (Rossi, 1790)

Material: Mazandaran province, Savadkooch, 5 specimens, September 2008.

Tasgius solskyi solskyi (Fauvel, 1875)

Material: Ardabil province, Ardabil, 4 specimens, October 2006.

Tribe Xantholinini Erichson, 1839

Genus *Gyrophypnus* Leach, 1819

Gyrophypnus fracticornis (O. Müller, 1776)

Material: Mazandaran province, Sari, 6 specimens, July 2005.

Genus *Leptacinus* Erichson, 1839

Leptacinus othioides Baudi di Selve, 1870

Material: Mazandaran province, Noor, 2 specimens, September 2005.

Comment: *Scarites (Parallelomorphus) terricola* Bonelli (Coleoptera: Carabidae) was collected as the predator of *L. othioides* from Noor.

Genus *Xantholinus* Dejean, 1821

Xantholinus graecus graecus Kraatz, 1858

Material: East Azerbaijan province, Tabriz, 2 specimens, September 2008.

Xantholinus rufipennis Erichson, 1839

Material: Golestan province, Azadshahr, 3 specimens, September 2007.

IV. Tachyporiane Group

Subfamily Phloeocharinae Erichson, 1839

Genus *Phloeocharis* Mannerheim, 1830

Phloeocharis longipennis Fauvel, 1875

Material: West Azerbaijan, Khoy, 2 specimens, August 2008.

Subfamily Tachyporinae MacLeay, 1825

Tribe Mycetoporini Thomson, 1859

Genus *Ischnosoma* Stephens, 1829

Ischnosoma myops (Eppelsheim, 1880)

Material: Fars province, Eghlid, 3 specimens, April 2006.

Genus *Mycetoporus* Mannerheim, 1830

Mycetoporus forticornis Fauvel, 1875

Material: Semnan province, Semnan, 2 specimens, October 2007.

Tribe Tachyporini MacLeay, 1825

Genus *Sepedophilus* Gistel, 1856

Sepedophilus testaceus (Fabricius, 1793)

Material: Khorasan province, Birjand, 4 specimens, June 2006.

Genus *Tachyporus* Gravenhorst, 1802

Tachyporus nitidulus (Fabricius, 1781)

Material: Mazandaran province, Sari, 3 specimens, July 2008.

Subfamily Aleocharinae Fleming, 1821

Tribe Aleocharini Fleming, 1821

Genus *Aleochara* Gravenhorst, 1802

Aleochara bipustulata (Linnaeus, 1761)

Material: Golestan province, Gorgan, 6 specimens, June 2008.

Comment: *Saropogon melanophrus* Bigot (Diptera: Asilidae) was collected as the predator of *A. bipustulata* from Behshahr.

Aleochara subtumida (Hochhuth, 1849)

Material: Guilan province, Roodsar, 2 specimens, August 2007.

Tribe Athetini Casey, 1910

Genus *Atheta* Thomson, 1858

Atheta exigua (Erichson, 1837)

Material: Mazandaran province, Joibar, 1 specimen, September 2006.

Atheta testaceipes (Heer, 1839)

Material: Golestan province, National Park, 2 specimens, July 2007.

Tribe Oxypodini Thomson, 1859

Genus *Euryalea* Mulsant &Rey, 1875

Euryalea jordanica (Coiffait, 1981)

Material: Mazandaran province, Behshahr, 1 specimen, September 2008.

Genus *Oxypoda* Mannerheim, 1830

Oxypoda flavicornis Kraatz, 1856

Material: Mazandaran province, Qaemshahr, 2 specimens, October 2006.

Oxypoda vittata Märkel, 1842

Material: Golestan province, Kordkoy, 3 specimens, July 2007.

DISCUSSION

The results of the present research show the diversity of rove beetles in different regions of Iran. In this research, a total of 94 species of 59 genera were collected from different regions. We suggest that this kind of survey should be continued in different regions and ecosystems. This will certainly result in the determining of many other species and new records, and probably new species, and it will contribute towards completing the recording of Iranian Staphylinidae. Iran is a large country with various climates and it can therefore be supposed that a large number of species remain to be discovered in different regions. Additionally, in this paper some natural enemies of staphylinids were determined.

In total, 7 species of robber flies (Diptera: Asilidae), 3 species of ground beetles (Coleoptera: Carabidae) and 2 species of ants (Hymenoptera: Formicidae) were collected as predators of Staphylinidae. Rove beetles have natural enemies. Scattered evidence needing review suggests that spiders, various insects (including Reduviidae, Carabidae, Asilidae,

Formicidae, etc.) amphibia, reptiles, birds, and bats, include Staphylinidae among their diets. Among the parasites, fungi play a major role, and hymenopterous parasitoids, nematodes, and Nemata, a relatively minor role. In temperate regions of the world, unlike tropical regions, staphylinids may achieve very high population levels at the soil surface; in tropical regions, at least at lower altitudes, ants are ubiquitous and staphylinids less numerous which suggests that ants may limit population levels of staphylinids (Frank and Thomas, 1991; Bordoni and Oromi, 1998).

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