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Araştırma Makalesi / Research Article

Ichneumonidae (Hymenoptera) species from Anatolia, Part III

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ABSTRACT: The objective of this study was to evaluate ichneumonid samples, collected from northeastern Anatolia (Erzurum: Pazaryolu-Kumaşkaya). Samples were collected during the summer period of 2015. Collected 14 species belong to Ichneumoninae, Ophioninae, Orthocentrinae and Pimplinae subfamilies. *Cylloceria sylvestris* (Gravenhorst, 1829) is new record for the Turkish fauna. Individual diversity, collecting locations, distribution data and short zoogeographical notes are given for each species.

Keywords: Hymenoptera, Ichneumonidae, New record, Erzurum, Turkey

Anadolu'dan Ichneumonidae (Hymenoptera) türleri, Kısım III

ÖZ: Bu çalışmanın amacı Kuzey Doğu Anadolu (Erzurum: Pazaryolu-Kumaşkaya)'dan toplanan Ichneumonidae örneklerini değerlendirmektir. Örnekler 2015 yılı yaz mevsiminde toplanmıştır. Toplanan 14 tür Ichneumoninae, Ophioninae, Orthocentrinae ve Pimplinae altfamilyalarına aittir. Bu türlerden *Cylloceria sylvestris* (Gravenhorst, 1829) Türkiye için yeni kayıttır. Her bir tür için bireysel çeşitlilik toplanma lokaliteleri, dağılışları ve zoocoğrafik alanlar verilmiştir.

Anahtar kelimeler: Hymenoptera, Ichneumonidae, Yeni kayıt, Erzurum, Türkiye

INTRODUCTION

Insects play significant roles in the ecology of the world due to their vast diversity of form, function and life-style; their considerable biomass; and their interaction with plant life, other organisms and the environment (Rico-Gray and Oliveira, 2007).

In Turkey, there was no detailed information available on Ichneumonidae until 1995. 383 ichneumonid species are listed in a catalog of the Ichneumonidae of Turkey by Kolarov (1995).

Today, the number of speceis Ichneumonidae is 1276 and 287 genera in the past 24 years (Özdan and Gürbüz, 2019; Çoruh et al., 2019). However, with more recent contributions (Çaylak, 2019) and this paper, the number of Ichneumonidae fauna of Turkey has reached to 1287 species and 288 genera.

As in this study, previous studies have been conducted on plants visited by Ichneumonidae species (Çoruh and Çoruh 2008, 2012; Çoruh, 2016, 2017, 2019). Besides some of the studies were conducted on the dedection of host identification

(Çoruh et al., 2004; Çoruh and Tozlu 2008; Özbek et al., 2009; Tozlu et al., 2010; Tozlu and Çoruh 2011; Okyar et al., 2012; Özbek and Çoruh 2012; Çoruh and Çalmaşur, 2016; Narmanlıoğlu and Çoruh, 2018)

The study was performed to identify ichneumonids in Kumaşkaya and to evaluate their host associations. Our aim is to present the richness of the ichneumonid species in this transition zone, located between two provinces (Rize-Erzurum).

MATERIAL AND METHOD

Study area

The present research was conducted in Pazaryolu (Kumaşkaya) locality (Figure 1) located in Erzurum Province (Figure 2) (Northeastern Anatolia). The collecting site, Kumaşkaya, is a bowl shaped area between two mountains and has floral richness. The sampling was carried out in all areas for *Carum carvi* L., *Chenopodium album* L., *Malva*

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neglecta Wallr., *Daucus carota* L. and primarily *Heracleum pastinacifolium* K. Koch.

Sampling method and collection

Specimens used in this study were collected using a standart sweeping net. They were captured using an aspirator and dropped directly into ethyl-alcohol (75%) by second author. The Ichneumonid specimens have been identified by Janko Kolarov (Plovdiv University, Bulgaria). Plant specimens were identified according to Davis (1965-1988) and the

herbarium of Atatürk University, Faculty of Agriculture, Department of Plant Protection, by the third author. The identified material are deposited in the insect collection of the Department of Entomology, Erzurum, Turkey (EMET). In table 1, are included valid taxa names, individual numbers, zoogeographical distribution and reference data were shown. The newly recorded species for the fauna of Turkey are indicated by an asterisk (*) in the text. General distributions of the species were taken from Yu et al. (2012).



Figure 1. Study area

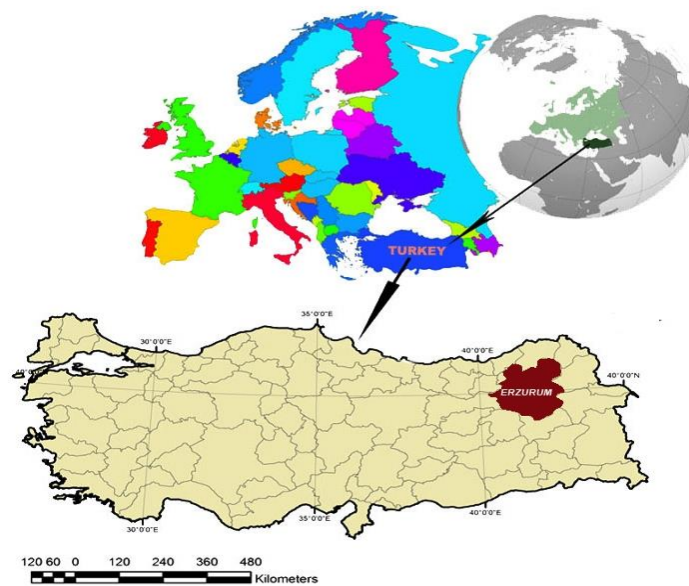


Figure 2. Map of the study area

RESULTS AND DISCUSSION

In the current study, a total of 14 species in 11 genera of Ichneumoninae, Ophioninae, Orthocentrinae and Pimplinae subfamilies are listed. All materials were collected near Erzurum, Pazaryolu, Kumaşkaya village (40° 31' 50.523" N, 40° 45' 16.686" E) from 1450 m a.s.l. altitude by S. Çoruh. Hosts and associate plants of the new records are given below.

Subfamily: Ichneumoninae Latreille, 1802

***Barichneumon bilunulatus* (Gravenhorst, 1829)**

Material examined: 26.VII.2015, 1 ♀.

Distribution: Algeria, Tunisia, Morocco, Europe, Azerbaijan, Georgia, Turkey, Iran, Kazakhstan and Western Siberia.

Hosts: Coleoptera, Curculionidae: *Lixus elegantulus*. Hymenoptera, Ichneumonidae: *Ophion luteus*. Lepidoptera, Erebidae: *Calliteara pudibunda*; Geometridae: *Bupalus piniarius*, *Ectropis crepuscularia*, *Lycia hirtaria*, *Macaria liturata*, *Operophtera brumata*; Noctuidae: *Mniotype adustus*, *Panolis flammea*; Tortricidae: *Sparganothis pilleriana* on *Angelica sylvestris*, *Chaerophyllum bulbosum*, *Daucus carota*, *Foeniculum vulgare*, *Heracleum sphondylium*, *Medicago sativa*, *Peucedanum oreoselinum*, *Pinus halepensis*.

Remark: This species was collected on *Daucus carota*.

***Coelichneumon (Coelichneumon) nigritor* Riedel, Çoruh & Özbek, 2010**

Material examined: 27.VII.2015, 1 ♀.

Distribution: Azerbaijan, Turkey.

Hosts: Unknown

***Coelichneumon (Coelichneumon) nudicoxator* Aubert, 1966**

Material examined: 26.VII.2015, 1 ♀.

Distribution: Turkey, Israel and Kazakhstan.

Hosts: Unknown

***Heterischnus anomalus* (Wesmael, 1857)**

Material examined: 29.VII.2015, 1 ♂.

Distribution: Europe and Turkey.

Host: Lepidoptera, Plutellidae: *Plutella xylostella* on *Heracleum sphondylium*.

***Heterischnus pulex* (Müller, 1776)**

Material examined: 28.VII.2015, 1 ♂.

Distribution: Europe.

Hosts: Lepidoptera, Pterophoridae:

Emmelina monodactyla on *Fagus sylvatica*, *Peucedanum oreoselinum*, *Pinus sylvestris*, *Quercus sessiliflora*.

***Hoplismenus bidentatus* (Gmelin, 1790)**

Material examined: 29.VII.2015, 1 ♀.

Distribution: Algeria, Europe, Turkey and Iran.

Hosts: Lepidoptera, Nymphalidae:

Lasiommata maera on *Angelica sylvestris*.

***Spilichneumon limnophilus* (Thomson, 1888)**

Material examined: 28.VII.2015, 6 ♀♀.

Distribution: Europe and Mongolia.

Hosts: Lepidoptera, Noctuidae: *Archanara algae*, *Archanara sparganii*, *Gortyna flavago*, *Nonagria typhae*.

Subfamily: Ophioninae Shuckard, 1840

***Enicospilus ramidulus* (Linnaeus, 1758)**

Material examined: 27.VII.2015, 1 ♀.

Distribution: Afrotropical, Oriental, Palaearctic region.

Hosts: Hymenoptera, Tenthredinidae:

Nematus salicis. Lepidoptera, Erebidae: *Catocala electa*, *Hyphantria cunea*; Lasiocampidae: *Dendrolimus pini*, *Eriogaster lanestris*, *Poecilocampa populi*; Noctuidae: *Agrotis segetum*, *Axyليا putris*, *Cucullia absinthii*, *Dypterygia scabriuscula*, *Hadena bicruris*, *H. rivularis*, *Lacanobia oleracea*, *L. pisi*, *Melanchnra persicariae*, *Ochroleura praecox*, *Panolis flammea*, *Phlogophora meticulosa*; Notodontidae: *Phalera bucephala*; Sphingidae: *Hyles euphorbiae* on *Alnus glutinosa*, *Carum carvi*, *Oryza sativa*, *Salvia glutinosa*, *Seseli libanotis*.

Subfamily: Orthocentrinae Förster, 1869

****Cylloceria sylvestris* (Gravenhorst, 1829)**

Material examined: 28.VII.2015, 1 ♂.

Distribution: Palaearctic region.

Remark: This species is new record from Turkey.

Subfamily: Pimplinae Wesmael, 1845

***Endromopoda detrita* (Holmgren, 1860)**

Material examined: 27.VII.2015, 1 ♀.

Distribution: Holarctic and Oriental Region.

Hosts: Coleoptera, Curculionidae:

Anthonomus pomorum, *Byctiscus betulae*, *Lixus elegantulus*. Diptera, Chamaemyiidae:

Chamaemyia juncorum; **Chloropidae**: *Lipara lucens*, *L. similis*. **Hymenoptera, Chalcidoidea**: *Tetramesa airae*; **Cephalidae**: *Calameuta filiformis*, *Cephus andrae*, *C. cinctus*, *C. nigrinus*, *C. pygmeus*, *Janus femoratus*; **Cynipidae**: *Andricus lignicola*, *Aphelonyx cerricola*. **Hymenoptera, Tenthredinidae**: *Euura amerinae*. **Lepidoptera, Coleophoridae**: *Coleophora laricella*; **Crambidae**: *Chilo phragmitellus*; **Gelechiidae**: *Anacamptis populella*, *Anarsia spartiella*; **Geometridae**: *Alcides trifidus*; **Lasiocampidae**: *Malacosoma neustria*; **Noctuidae**: *Coenobia rufa*; **Pterophoridae**: *Adaina microdactyla*, *Mesoligia literosa*; **Pyralidae**: *Dioryctria simplicella*; **Sesiidae**: *Paranthrene tabaniformis*, *Synanthedon formicaeformis*; **Tortricidae**: *Celypha lacunana*, *Cydia cosmophorana*, *C. discretana*, *C. funebrana*, *C. pomonella*, *C. splendana*, *Eucosma krygeri*, *Eupoecilia ambiguella*, *Hedya nubiferana*, *Lobesia botrana*, *Phalonidia udana*, *Rhyacionia buoliana*, *R. resinella*, *Tortrix viridana*; **Yponomeutidae**: *Argyresthia laevigatella* on *Adonis vernalis*, *Angelica sylvestris*, *Chaerophyllum aromaticum*, *Cnicus paluster*, *Daucus carota*, *Daucus carota sativus*, *Foeniculum vulgare*, *Juniperus communis*, *Peucedanum oreoselinum*.

Remark: This species was collected on *Heracleum pastinacifolium*.

***Gregopimpla inquisitor* (Scopoli, 1763)**

Material examined: 26.VII.2015, 1 ♂, 1 ♀.

Distribution: Holarctic Region.

Hosts: It has 70 host species that belong to various families (Anobiidae, Arctiidae, Argyresthiidae, Attelebidae, Blastodacnidae, Cephalidae, Choreutidae, Curculionidae, Cynipidae, Depressariidae, Diprionidae, Gelechiidae, Geometridae, Lasiocampidae, Lymantriidae, Noctuidae, Pieridae, Psychidae, Pterophoridae, Pyralidae, Tenthredinidae, Tortricidae, Yponomeutidae, Zygaenidae) on *Alnus glutinosa*, *Daucus carota sativus*, *Epilobium angustifolium*, *Heracleum sphondylium*, *Impatiens parviflora*.

***Itopectis maculator* (Fabricius, 1775)**

Material examined: 29.VII.2015, 1 ♂.

Distribution: Tunisia, Morocco, Europe, Iran, Mongolia.

Hosts: It has 158 host species that belong to various families (Braconidae, Choreutidae, Chrysomelidae, Coleophoridae, Curculionidae, Cynipidae, Depressariidae, Diprionidae, Gelechiidae, Geometridae, Gracillariidae, Heterognidae, Ichneumonidae, Anobiidae, Arctiidae, Lasiocampidae, Lycaenidae, Lymantriidae, Momphidae, Noctuidae, Nolidae, Nymphalidae, Oecophoridae, Pieridae, Plutellidae, Psychidae,

Pterophoridae, Pyralidae, Tenthredinidae, Tortricidae, Yponomeutidae, Zygaenidae) on *Adonis vernalis*, *Alnus glutinosa*, *Chaerophyllum bulbosum*, *Cnicus paluster*, *Daucus carota*, *Epilobium angustifolium*, *Euphorbia nicaeensis*, *Fraxinus excelsior*, *Heracleum sphondylium*, *Peucedanum oreoselinum*, *Picea abies*, *Picea excelsa*, *Pinus sylvestris*, *Quercus ilex*, *Quercus sessiliflora*, *Taxus baccata*.

***Scambus brevicornis* (Gravenhorst, 1829)**

Material examined: 29.VII.2015, 2 ♂♂.

Distribution: Holarctic Region.

Hosts: It has 135 host species that belong to various families (Anthomyiidae, Blastodacnidae, Braconidae, Buprestidae, Cerambycidae, Choreutidae, Coleophoridae, Curculionidae, Cynipidae, Depressariidae, Diprionidae, Gelechiidae, Geometridae, Gracillariidae, Lasiocampidae, Lymantriidae, Momphidae, Noctuidae, Oecophoridae, Pieridae, Plutellidae, Pterophoridae, Pyralidae, Tenthredinidae, Tephritidae, Tischeriidae, Tortricidae) on *Alnus glutinosa*, *Anethum graveolens*, *Angelica sylvestris*, *Aster tripolium*, *Cirsium arvense*, *Cirsium vulgare*, *Cnicus paluster*, *Daucus carota*, *Fraxinus excelsior*, *Larix europaea*, *Larix polonica*, *Peucedanum oreoselinum*, *Populus tremula*, *Salvia sylvestris*, *Suaeda maritima*, *Vincetoxicum officinale*.

***Scambus nigricans* (Thomson, 1877)**

Material examined: 29.VII.2015, 1 ♂.

Distribution: Palearctic region.

Hosts: **Diptera, Chloropidae**: *Lipara lucens*; **Tephritidae**: *Noeeta pupillata*, *Oxya parietina*. **Hymenoptera, Cephalidae**: *Hartigia linearis*; **Tenthredinidae**: *Heptamelus ochroleucus*. **Lepidoptera, Depressariidae**: *Agonopterix heracliana*, *Depressaria daucella*, *D.pastinacella*; **Gelechiidae**: *Scrobipalpa clintoni*; **Geometridae**: *Alsophila aescularia*, *Apocheima hispidaria*, *Phigalia pilosaria*; **Lycaenidae**: *Lycaena dispar batava*, *L. pomonaria*; **Momphidae**: *Mompha conturbatella*; **Noctuidae**: *Gortyna flavago*; **Prodoxidae**: *Lampronia morosa*, *Pseudaletia unipuncta*; **Pterophoridae**: *Adaina microdactyla*, *Platyptilia nemoralis*; **Pyralidae**: *Dioryctria simplicella*, *Epiblema cirsiana*, *Epiblema scutulana*; **Pyralidae**: *Myelois circumvoluta*; **Tortricidae**: *Aethes francillana*, *A. williana*, *Cnephasia stephensiana*, *Cochylis atricapitana*, *Cydia delineana*, *C. discretana*, *C. pactolana*, *Rhyacionia buoliana*, *Triedris paleana* on *Anethum graveolens*, *Chaerophyllum bulbosum*, *Daucus carota*, *Euphorbia nicaeensis*, *Heracleum sphondylium*, *Peucedanum oreoselinum*.

Remark: This species was collected on *Heracleum pastinacifolium*.

Table 1. Faunistic evaluations of Ichneumonidae species

Collected species (Erzurum, Pazaryolu, Kumaşkaya Village (40° 31' 50.523" N, 40° 45' 16.686" E.), 26-29.VII.2015, 1450 m a.s.l.)					
Name of species	IN		Distribution in Turkey	References	NR
	♂	♀			
Subfamily: Ichneumoninae Latreille, 1802					
<i>Barichneumon bilunulatus</i> (Gravenhorst, 1829)		1	Erzurum, Kars, Konya	Özdemir, 1996; Çoruh, 2017; Riedel et al., 2010, 2018.	
<i>Coelichneumon</i> (<i>Coelichneumon</i>) <i>nigritor</i> Riedel, Coruh & Ozbek, 2010)		1	Erzurum	Riedel et al., 2010; Çoruh et al., 2011.	
<i>Coelichneumon</i> (<i>Coelichneumon</i>) <i>nudicoxator</i> Aubert, 1966		1	Eastern Anatolia, Erzurum	Riedel, 2008; Riedel et al., 2010; Çoruh et al., 2011; Çoruh, 2017.	
<i>Heterischnus anomalus</i> (Wesmael, 1857)	1		Artvin, Erzurum, Trabzon	Özbek et al., 2003; Çoruh et al., 2014b; Çoruh, 2017; Çoruh et al., 2019.	
<i>Heterischnus pulex</i> (Müller, 1776)	1		Erzurum	Riedel et al., 2018.	
<i>Hoplismenus bidentatus</i> (Gmelin, 1790)		1	Erzurum, İstanbul, Tunceli	Kolarov, 1989; Kolarov, 1995; Riedel et al., 2010; Çoruh et al., 2011, Kolarov et al., 2014a, Çoruh, 2017.	
<i>Spilichneumon limnophilus</i> (Thomson, 1888)		6	Erzurum	Çoruh et al., 2011; Çoruh et al., 2014b, Çoruh, 2017.	
Subfamily: Ophioninae					
<i>Enicospilus ramidulus</i> (Linnaeus, 1758)		1	Ankara, Bolu, Erzincan, Erzurum, Isparta, Karabük, Kastamonu, Malatya, Nevşehir, Konya, Rize, Sinop, Tekirdağ, Trabzon, Zonguldak	Kolarov 1989, 1994, 1995; Kolarov et al., 2000; Kolarov and Gürbüz, 2006; Beyarslan et al., 2006; Okyar and Yurtcan, 2007; Kolarov et al., 2014b; Çoruh and Çalmaşur, 2016.	
Subfamily: Orthocentrinae Förster, 1869					
<i>Cylloceria sylvestris</i> (Gravenhorst, 1829)	1		New record from Turkey	Present study	X
Subfamily: Pimplinae Wesmael, 1845					
<i>Endromopoda detrita</i> (Holmgren, 1860)		1	Afyon, Bayburt, Burdur, Bursa, Çanakkale, Denizli, Edirne, Erzincan, Erzurum, Gümüşhane, Iğdır, Isparta, İstanbul, İzmir, Kars, Kırklareli, Rize, Tekirdağ, Tunceli	Kolarov, 1987; Özdemir and Kılınçer, 1990; Öncüer, 1991; Kolarov and Beyarslan, 1994; Kolarov, 1995; Kolarov et al., 1997a, b, 1999; Gürbüz, 2005; Yurtcan, 2007; Çoruh and Kolarov, 2010; Kolarov et al., 2014b; Çoruh, 2016.	
<i>Gregopimpla inquisitor</i> (Scopoli, 1763)	1	1	Edirne, Erzurum, Kırklareli, Rize, Tekirdağ	Çoruh, 2005; Yurtcan, 2007; Çoruh et al., 2014a; Çoruh, 2016.	
<i>Itopectis maculator</i> (Fabricius, 1775)	1		Adana, Ankara, Afyon, Artvin, Balıkesir, Bitlis, Bolu, Çanakkale, Çorum, Denizli, Edirne, Eskişehir, Erzurum, Gümüşhane, Isparta, İstanbul, İçel, İzmir, Kars, Kastamonu, Kırklareli, Kırşehir, Konya, Manisa, Nevşehir, Niğde, Muğla, Rize, Sinop, Tekirdağ, Trabzon, Van, Yozgat, Zonguldak	Özdemir and Kılınçer, 1990; Kolarov and Beyarslan, 1994; Kolarov, 1995; Özdemir and Özdemir, 2002; Gürbüz, 2005; Kolarov and Gürbüz, 2004; Çoruh, 2005; Gürbüz, 2005; Yurtcan and Beyarslan, 2005; Gürbüz et al., 2009; Çoruh and Kolarov, 2010; Birol, 2010; Eroğlu et al., 2011, Çoruh et al., 2014b; Okyar and Yurtcan, 2007; Kolarov et al., 2016, Çoruh, 2016.	
<i>Scambus brevicornis</i> (Gravenhorst, 1829)	2		Ankara, Artvin, Bingöl, Bitlis, Edirne, Erzurum, Isparta, İstanbul, Kırklareli, Kars, Rize, Tekirdağ	Kolarov, 1995; Özdemir and Kılınçer, 1990; Kolarov and Beyarslan, 1994; Kolarov et al., 1999; Özdemir and Özdemir, 2002; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan and Beyarslan, 2005; Yurtcan, 2007; Birol, 2010; Çoruh and Kolarov, 2010; Eroğlu, 2010; Çoruh, 2016.	
<i>Scambus nigricans</i> (Thomson, 1877)	1		Afyon, Artvin, Balıkesir, Bayburt, Burdur, Bursa, Çanakkale, Denizli, Edirne, Erzincan, Erzurum, Isparta, İstanbul, İzmir, Kahramanmaraş, Kars, Kırklareli, Tekirdağ	Kolarov and Beyarslan, 1994; Kolarov et al., 1997a, Kolarov et al., 1999; Kolarov and Gürbüz, 2004; Çoruh, 2005; Yurtcan, 2007; Çoruh et al., 2007; Çoruh and Kolarov, 2010; Çoruh and Çalmaşur, 2011; Çoruh, 2016.	

(IN): Individual numbers; (NR): New record

The zoogeographical characterization mainly follows the chorotype classification of the Near East fauna proposed by Taglianti et al. (1999).

- 1) Most wide range has the species *Enicospilus ramidulus*, distributed in 3 zoogeographical regions-Afrotropical, Oriental and Palaearctic region.
- 2) Ranges in two zoogeographical regions has the species *Endromopoda detrita*.
- 3) Holarctic ranges have the species *Gregopimpla inquisitor* and *Scambus brevicornis*.
- 4) Most numerous species are the ones which distributed in Palaearctic ranges. Here belong the species *Cylloceris sylvestris*, *Itopectis maculator* and *Scambus nigricans*.
- 5) Sibero - european range has the species *Barichneumon bilunulatus*.
- 6) *Spilichneumon linnophilus* has Centralasian-european range.
- 7) Turano – europeo - mediterranean range has the species *Heterischnus bidentatus*.
- 8) Turanian range has the species *Coelichneumon nudicoxator* (*Coelichneumon*).
- 9) Two species - *Heterischnus anomalus* and *H. pulex*, have European ranges.
- 10) One species - *Coelichneumon nigrator* (*Coelichneumon*) *nigrator* is now an Anatolian subendemic.

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Statement of Conflict of Interest

Authors have declared no conflict of interest.

Authors' Contributions

The contributions of authors are equal.

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