

## Correspondence

### **First record of quill mites of the family Syringophilidae Lavoipierre (Acari: Cheyletoidea) from Iran**

Gholamreza Beyzavi

*Hakhamanesh Bldg., Shimi-Giah St., Dr. Hesabi Blvd., Shiraz, Iran; E-mail: Beyzavi.reza@yahoo.com*

The Cheyletoidea is a large superfamily of suborder Prostigmata and most of the cheyletoid families including Syringophilidae, Harpirhynchidae, Psorergatidae and Demodicidae are represented by permanent parasites of vertebrates and only one family namely Cheyletidae includes both free-living and parasitic forms of birds and mammals. Many species of these parasitic mites have importance role in public health and they can cause some damages like demodicosis in man, dogs and cats, syringophilosis in chickens and cheyletiellosis in peoples who are dealing with infected pets (Bochkov & Galloway 2004; Bochkov 2008).

It has been noted that most of zooparasitic mites were nest-inhabiting and free-living predators, keratinophagous, coprophagous or phoretic forms. Although, we have no records of syringophilid fossils yet, it seems that they were diverged from a common cheyletoid-like ancestor in the bird nests (Fain *et al.* 2000; Dusbábek 2002; Dunlop *et al.* 2014).

These mites are permanent parasites inhabiting quill cavities of different types of feathers (primaries, secondaries, coverts, tail-feathers and body feathers). They feed by piercing the quill fibrous wall with their flexible stylettiform chelicerae and therefore causing broken feathers. They also reproduce in this place. The effect of an infestation with this mite on egg production and general health of chickens has not been evaluated but the presumption is that beyond the loss of feathers and the unsightly appearance of the birds, very little damage results (Roberts 1952; Hwang 1959; Kethley 1971).

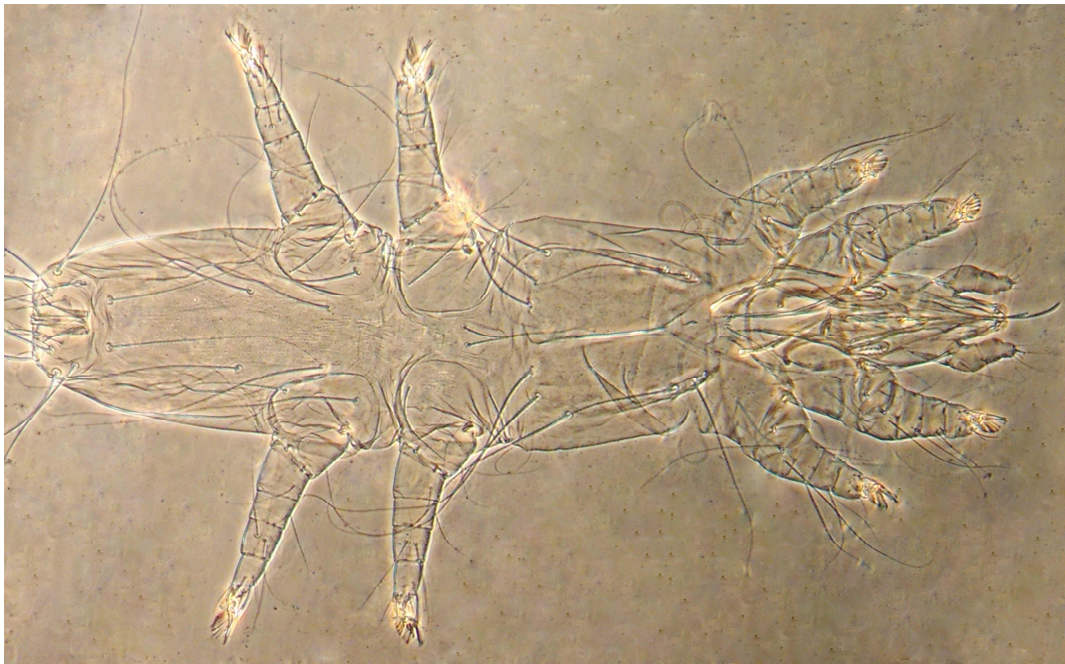
The world biodiversity of Syringophilidae includes about 335 species grouped in 60 genera and described from more than 470 bird species belonging to 24 orders that are distributed in all zoogeographical regions. Based on the high numbers of their host, actual number of syringophilids could be more than 5000 species. These mites show a high degree of host specificity, where most of species are monoxenous (parasitizing one host species) or narrowly oligoxenous (parasitizing several closely related host species). Oligoxenous ones are restricted to a single bird genus or group of closely related genera. In addition, it is possible to find two or more different syringophilid species, usually representing different genera parasitizing the one bird or same host individual. In these cases quill mites occupying separate niches in the plumage of the host (Kethley 1970, 1973; Kethley & Johnston 1975; Skoracki *et al.* 2010, 2012; Skoracki 2011; Sikora *et al.* 2014).

Morphologically syringophilids are large, elongate mites with weakly sclerotized cuticle and white color in life. Palp claw process is absent in this family and coxa II is separated from coxa III (not contiguous). One pair of claws and a bipectinate empodium are present on each leg. At present, this family is divided into two subfamilies:

Syringophilinae Lavoipierre and Picobiinae Johnston & Kethley, and both are occurred in the Palaearctic region. The main differences between both subfamilies are visible in morphology and ecology of these mites e.g. in syringophilines the distal tip of the palp tibiotarsus is rounded, proral setae are multiserrate, females are not capable to physogastry and the main microhabitats are quills of wing and tail feathers; in picobiines, distal tip of the palp tibiotarsus is tapering, proral setae are rod-like and with two minute tines, females are able to physogastry, and the main microhabitats are quills of the body feathers. In this family, deutonymph is absent in the life cycle and adult females could be distinguished by presence of genito-anal opening and their occurrence in the terminal part of the body and also in some details of the leg chaetotaxy (Johnston & Kethley 1973; Skoracki 2011).

The oldest and the type genus of the family is *Syringophilus* Heller contains two large-sized species (total body length 900–1240 µm) distributed in Palearctic, Nearctic, Ethiopian and Neotropical region. In adult females of this genus, the large gnathosoma is devoid protuberances, the distal tip of the movable cheliceral digits is needle like, the peritremes are U-shaped with clearly visible chambers, the dorsal and ventral sclerotizations are well developed, the body and the legs are with full complement of setae. Both species of this genus are associated with birds of family Phasianidae (Galliformes) (Bochkov 2000; Skoracki 2011).

A single wing's feather of rooster (type host), *Gallus gallus domesticus* (Linnaeus) (Galliformes: Phasianidae) was found in a chicken coop and a few mites observed on its downy barb. For finding more individuals the quill was examined under stereomicroscope and its calamus was opened by scalpel. A large number of *Syringophilus bipectinatus* Heller (Fig. 1) obtained from this quill including all the life stages which their heavily infestation discolored the calamus part.



**Figure 1.** *Syringophilus bipectinatus* Heller - Habitus of adult (female).

This oligoxenous species has worldwide distribution and was collected from its type host and also from *Alectoris rufa* (Linnaeus) and *Ptilopachus petrosus* (Gmelin). In

the Palearctic region, the largest ecozone, this species have been recorded from France, Germany, Poland, Ukraine, Belorussia, Russia, Kirghizia, China, Cameroon (Bochkov 2000; Skoracki 2011) and Iran (present study).

In *S. bipectinatus*, the shape of the hypostomal apex is rounded, peritremes are U-shaped in females and M-shaped in males and setae *ag3* are 1.2–1.3 times longer or subequal in length with *ag1*. In another species of the genus, *S. numidae* Bochkov, 2000 the hypostomal apex is tapering and setae *ag3* are two times longer than *ag1*. The latter species was recorded from Ethiopian region (Bochkov 2000; Skoracki 2011).

Material of this study was collected by the author in Jari-Abad village, Fars province, Iran, 26 Jun 2013. Mounted specimens includes 11 larvae, four protonymphs, 13 tritonymphs, 35 females and six males and are deposited in the personal collection of the author. Two males and two females was sent to Dr. Maciej Skoracki, Adam Mickiewicz University, Poznan, Poland and a complete series will be send to the Acarological Collection, Acarological Society of Iran, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran.

#### Acknowledgement

I would express my deepest thanks to Dr. M. Skoracki, for his kindly helps during this work.

#### References

- Bochkov, A.V. (2000) *Syringophilus numidae* sp. n., a new species of quill mites (Acarina: Syringophilidae) ex *Numida meleagris* (Galliformes: Phasianidae) from South Africa. *Acarina*, 8: 103–104.
- Bochkov, A.V. (2008) New observations on phylogeny of cheyletoid mites (Acari: Prostigmata: Cheyletoidea). *Proceedings of the Zoological Institute RAS*, 312: 54–73.
- Bochkov, A.V., Galloway, T.D. (2004) New species and records of cheyletoid mites (Acari: Cheyletoidea) from birds in Canada. *Journal of the Kansas Entomological Society*, 77(1): 26–44.
- Dunlop, J.A., Penney, D. & Jekel, D. (2014) A summary list of fossil spiders and their relatives. In: Platnick, N.I. (Ed.) *The world spider catalog, version 14.5*. American Museum of Natural History, Available from: <http://research.amnh.org/entomology/spiders/catalog/index.html> (accessed on August 2014).
- Dusbábek, F. (2002) Adaptation of mites and ticks to parasitism. Medical and veterinary aspects. In: Bernini, F., Nannelli, R., Nuzzaci, G. & de Lillo, E. (Eds.), *Acarid phylogeny and evolution. Adaptations in mites and ticks*. Proceedings of the 4<sup>th</sup> Symposium of EURAAC, Siena, Italy, Kluwer Academic Publishers, Dordrecht, pp. 399–418.
- Fain, A., Bochkov, A.V. & Mironov, S.V. (2000) New genera and species of quill mites of the family Syringophilidae (Acari: Prostigmata). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique*, 70: 33–70.
- Hwang, J.C. (1959) Case reports of the quill mite, *Syringophilus bipectinatus* in poultry. *Proceedings of the Helminthological Society of Washington*, 26: 47–50.
- Johnston, D.E. & Kethley, J.B. (1973) A numerical phenetic study of the quill mites of the family Syringophilidae (Acari). *Journal of Parasitology*, 59: 520–530.


- Kethley, J.B. (1970) A revision of the family Syringophilidae (Prostigmata: Acarina). *Contributions of the American Entomological Institute*, 6: 1–76.
- Kethley, J.B. (1971) Population regulation in quill mites (Acarina: Syringophilidae). *Ecology*, 52:1113–1118.
- Kethley, J.B. (1973) A new genus and species of quill mites (Acarina: Syringophilidae) from *Colinus virginianus* (Galliformes: Phasianidae) with notes on developmental chaetotaxy. *Fieldiana Zoology*, 65: 1–8.
- Kethley, J.B. & Johnston, D.E. (1975) Resource tracking patterns in bird and mammal ectoparasites. *Miscellaneous Publications of the Entomological Society of America*, 9: 227–236.
- Roberts, F.H.S. (1952) *Insects affecting livestock with special reference to important species occurring in Australia*. Angus & Robertson, Sydney & London, 267 pp.
- Sikora, B., Kaszewska, K. & Skoracki, M. (2014) Two new quill mites of the family Syringophilidae (Acari: Prostigmata) parasitising the tapaculos (Passeriformes: Rhinocryptidae) in South America. *Zootaxa*, 3895 (3): 419–426.
- Skoracki, M. (2011) Quill mites (Acari: Syringophilidae) of the Palaearctic region. *Zootaxa*, 2840: 1–415.
- Skoracki, M., Michalik, J. & Sikora, B. (2010) Prevalence and habitat preference of quill mites (Acari, Syringophilidae) parasitizing forest passerine birds in Poland. *Acta Parasitologica*, 55(2): 188–193.
- Skoracki, M., Zabłudovskaya, S., Bochkov, A.V. (2012) A review of Prostigmata (Acariformes: Trombidiformes) permanently associated with birds. *Acarina*, 20: 67–107.

*Received: 6 January 2015*

*Accepted: 9 January 2015*

*Published: 15 January 2015*

#### COPYRIGHT

 Beyzavi. Persian Journal of Acarology is under free license. This open-access article is distributed under the terms of the Creative Commons-BY-NC-ND which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.