Journal of Pollution Effects & Control
ISSN: 2375-4397

Piotr, J Pollut Eff Cont 2015, 3:2
DOI: 10.4172/2375-4397.1000e110

Editorial Open Access

Accidental Acarophagy – Is it Safe for us?

Skubała Piotr*

Department of Ecology, University of Silesia, Bankowa 9, 40-007 Katowice, Poland

Oribatid mites have successfully invaded almost all compartments of the biosphere. They are ubiquitous and, with the exception of the open oceans, they exist in every sort of terrestrial, aquatic, arboreal and parasitic habitat [1]. They are found at every elevation and every latitude, from the Arctic to the Antarctic. Mites have a diversity of function in the ecosystem, as shown by the range of feeding guilds to which they belong [2]. They include predators, parasites, fungal feeders, root feeders, bacterial feeders, omnivores, and scavengers [3]. Ignoring mites, however, is a mistake. They are not passive inhabitants of ecosystems; rather they are strong interactors and major components of biological diversity [1].

The numerous occurrence of mites in almost all microhabitats suggest that they should be an important source of food for many animals. And really fragments of mites have been found in the gut contents of many invertebrates, e.g. beetles, ants, centipedes, symphylans, diplurans, spiders, pseudoscorpions, opilionids and other mites [1]. Some vertebrates were also recognized as feeders of the Acari. The mite gluttons of the vertebrate world are the amphibians, e.g. frogs [4], toads [5] or salamanders [6]. Some groups of mites, e.g. Oribatida, Uropodina and Gamasina, are extremely abundant on the forest floor and small vertebrates foraging on the ground also eat at least the larger mites. Oribatid mites (heavily sclerotised mites) are most commonly reported in gut contents of vertebrates [1].

Do we also consume mites while eating muesli with flakes, nuts and fruits or a healthy salad? Taking into consideration the occurrence of mites everywhere and that they are usually unseen for the unaided eye, we would have to come to the conclusion that accidental acarophagy must be common and even we eat lots of mites.

Mites associated with our diet, those occurring with fruits, vegetables, mushrooms, teas or herbs, have rarely been studied [7-9]. Thorough studies on mites associated with stored apples are worth mentioning [7]. All samples of stored apples were infested with numerous and diversified acarofauna. A single apple contained at average more than 100 individuals of mites (maximum about 900). The author collected 22 mite species, 8 acaroid species representing Acaridae and Glycyphagidae, 2 eriophyids (Eriophyidae), 4 tarsonemid (Tarsonemmidae), 3 tetranychids (Tetranychidae) and 5 predatory species (Aceosejidae, Cheyletidae, Phytoseiidae, Stigmaeidae). Almost 50% of packaged herbs directly for consumption was contaminated with mites. However, the number of allergenic mites was low (5.3%) [8].

Skubała and co-authors studied the presence of mites in 90 food samples, representing 24 sorts of fruits, vegetables and mushrooms. Acarological analyses of the products detected the presence of 53 mite species of the orders Oribatida, Actinedida, Tarsonemida, Acaridida and Gamasida. Over 65% of the analysed samples were infested with mites. Oribatid mites were found most frequently and accounted for over 55% of total catch. Mites of the orders Actinedida, Tarsonemida, Acaridida and Gamasida comprised 15.5%, 11.3%, 10.9% and 6.8% of total catch, respectively. The species richness of collected oribatid mites was impressive -27 species. Thirteen species of gamasid mites and 9 species of actinedid mites were found in the material, whereas acaridids and tarsonemids were represented by 5 and 3 species, respectively. The highest number of mites was collected from fruits with uneven surface, covered with numerous hairs, e.g. raspberries, strawberries and red currants [9].

It was interesting to observe how ineffective is cleaning of fruits and vegetables in running water and how many mites still remained on the cleaned samples. In general we can conclude that only 48.6% and 50% of the total number of mites were removed from fruits and vegetables, respectively. For example on ten washed raspberries we collected: four, two, two and one individual of *Schwiebea sp., Medioppia obsoleta*, *Sellnickochthonius immaculatus* and *Oppiella nova*, respectively. On one washed head of brussels sprout still occurred one representative of the family *Bdellidae, two individuals of family Scutacaridae and one specimen of Hypochthonius rufulus* [9].

Should we be afraid of eating a desert prepared from strawberries or a salad with lettuce, carrot and paprika? Indeed, many mite species, e.g. numerous acaridids, house dust mites or tarsonemids produce strong allergens [10]. Furthermore, some species of the Acaridida and the Oribatida are intermediate hosts of tapeworms, e.g. *Moniezia expansa* or *Catenotaenia pusilla* [11]. Faeces of acaridid mites can pollute food. Fortunately, the number of mites on a single washed fruit or vegetable is generally low. Furthermore, their small size and cryptic appearance make mites difficult to detect and thus, they are practically impossible to remove from food products. So enjoy your breakfast or dinner and have a reflection on impressive diversity of life while eating. Mites are a part of amazing diversity on the planet, which is still only partly described.

References

1. Walter DE, Proctor HC (1999) New York, USA, pp. 322.
2. Moore JC, Walter DE, Hunt HW (1988) Arthropod regulation of micro- and mesobiota in below-ground detrital food webs. Ann Rev Ent 33: 419-439.
3. Krantz GW, Walter DE (eds.) (2009) A Manual of Acarology. 3rd Edn. Texas Tech University Press, Lubbock, Texas.
4. Stewart MM, Woolbright LL (1996) Amphibians, In: Reagan DP, Waide RB (eds.) The Food Web of a Tropical Rain Forest, University of Chicago Press: Chicago, pp. 273-320.
5. Flowers MA, Graves BM (1995) Prey selectivity and size-specific diet changes in *Bufo cognatus* and *B. woodhousii* during early postmetamorphic ontogeny. J Herpetol 23: 608-612.
6. Norton RA, MacNamara MC (1976) The common newt (*Notophthalmus viridescens*) as a predator of soil mites in New York. **J** Ga **Entomol Soc** 11: 89-93.

***Corresponding author:** Skubała Piotr, Department of Ecology, University of Silesia, Bankowa 9, 40-007 Katowice, Poland, Tel: 48 32 359-11-48; E-mail: Piotr.Skubala@us.edu.pl

Received April 14, 2015; **Accepted** April 15, 2015; **Published** April 18, 2015

Citation: Piotr S (2015) Accidental Acarophagy – Is it Safe for us? J Pollut Eff Cont 3: e110. doi:10.4172/2375-4397.1000e110

7. Chmielewski W (1998) Mites (Acarina) collected from stored apples. J Fruit Ornam Plant Res 6: 33-40.

8. Koryciak-Komarska H (2000) Ocena częstości występowania roztoczy (Acari) o znaczeniu medycznym w próbkach ziół rozprowadzanych w handlu hurtowym na terenie Górnego Śląska, In: Akarologia polska u progu nowego tysiąclecia, Ignatowicz S, Editor. Wyd. SGGW, Warszawa, pp. 301-310.

9. Skubała P, Marzec A, Sokołowska M (2006) Accidental acarophagy: mites found on fruits, vegetables and mushrooms. Biol Lett 43: 249-255.

10. Solarz K (2002) Roztocze alergogenne, In: Deryło A (ed.) PWN, Parazytologia i akaroentomologia medyczna, Warszawa, pp. 332-377.

11. Denegri GM (1993) Review of oribatid mites as intermediate hosts of tapeworms of the Anoplocephalidae. Exp Appl Acarol 17: 567-580.