

Literatur

- Abdella, M.M.H., Tawfik, M.F.S., Awadallah, K.T., 1985: Biological studies on the bethylid parasitism *Holepyris sylvanidis* Brèthes. *Annals of Agricultural Science, Moshtohor* **23**, 1355-1363.
- Ahmed, K.N., Islam, W., 1988: A new record of the parasite *Rhabdopyris zaeae* Waterston (Hymenoptera: Bethyilidae) from Bangladesh and some aspects of its biology. – *Bangladesh Journal of Zoology* **16** (2): 137-141.
- Ahmed, K.N., Khatun, M., Nargis, A., Dey, N.C., 1997: Mating, egg-laying and host feeding behaviour of *Rhabdopyris zaeae* Waterston (Hymenoptera: Bethyilidae) parasitizing *Tribolium confusum* larvae. *Bangladesh Journal of Scientific and Industrial Research* **4**, 633-637.
- Al-Kirshi, A.G., Reichmuth, Ch., Bochow, H., 1997: Eignung des Larvalparasitoiden *Laelius pedatus* (Say) (Hymenoptera, Bethyilidae) zur Bekämpfung des Khaprakäfers *Trogoderma granarium* Everts (Coleoptera, Dermestidae) in Getreide. – *Mitteilungen der Deutschen Gesellschaft für allgemeine und angewandte Entomologie* **11**: 367-372.
- Ghent, A.W., 1966: Studies of behavior of *Tribolium* flour beetles 2. Distributions in depth of *T. castaneum* and *T. confusum* in fractionable shell vials. – *Ecology* **47** (3): 355-367.
- Reichmuth, Ch., Schöller, M., Ulrichs, C., 2007: *Stored Product Pests in Grain: Morphology - Biology - Damage - Control*. AgroConcept Verlagsgesellschaft, Bonn: 170 Seiten.
- Schöller, M., 2000: Forager in the rye: biological control of *Ephestia elutella* in bulk grain. – In: Adler, C. & Schöller, M. (Hrsg.), *Integrated Protection of Stored Products*, IOBC-WPRS Bulletin **23** (10), 149-159.
- Schöller, M., Hassan, S.A., Reichmuth, Ch., 1996: Efficacy assessment of *Trichogramma evanescens* and *T. embryophagum* (Hym.: Trichogrammatidae) for control of stored products moth pests in bulk wheat. – *Entomophaga* **41** (1), 125-132.
- Schöller, M., Reichmuth, Ch., Hassan, S.A., 1994: Studies on biological control of *Ephestia kuehniella* Zeller (Lep.: Pyralidae) with *Trichogramma evanescens* Westwood (Hym.: Trichogrammatidae) - host-finding ability in wheat under laboratory conditions. – *Proceedings of the 6th International Working Conference on Stored-product Protection*, 17-23 April 1994, Canberra, Australia, Vol. **2**, 1142-1146.
- Sokoloff, A. 1972/1974: *The Biology of Tribolium*, with Special Emphasis on Genetic Aspects. – Oxford University Press, London, Volume 1/2, 300/610 S.
- Steidle, J., Schöller, M., 2000: Host finding of the granary weevil parasitoid *Lariophagus distinguendus* (Hymenoptera: Pteromalidae) in a storage environment. – *Integrated Protection of Stored Products*, IOBC-WPRS Bulletin **23** (10), 135-141.
- Wool, D., 1969: Depth distribution of adults and immatures of two *Tribolium castaneum* strains in pure and mixed cultures. – *Researches on Population Ecology* **11**, 137-149.

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A statistical evaluation of the contribution of mineral and tap water to the dietary intake of AS, B, Cu, Li, Mo, Ni, Pb, U and Zn by humans

Abstract

Agriculture is a main contributor to environmental loads of nearly all elements of the periodic table. Mineral fertilizers, especially mineral phosphorus fertilizers, contain significant amounts of elements which affect the environment. The annual average loads of the elements arsenic (As), boron (B), copper (Cu), lithium (Li), molybdenum (Mo), nickel (Ni), lead (Pb), uranium (U) and zinc (Zn) to the entire agricultural land in Germany by the application of phosphorus fertilizers correspond to 38, 1575, 170, 10, 71, 50, 14, 239 and 604 tons, respectively. Some of these elements are essential for plants and higher organisms, for example B, Cu and Mo; others show a significant toxicity for life processes such as As, Pb and U. However, also essential elements such as Cu and Zn are toxic in higher concentrations. There are two major pathways by which elements enter the food chain: either by the uptake into food and forage plants or by leaching in potable ground and surface water bodies. As data on the contribution of drinking water to the total daily intake of these elements are scarce a study was conducted to evaluate the relative significance of mineral and tap waters to the total daily intake of the elements As, B, Cu, Li, Mo, Ni, Pb, U and Zn by humans. Preliminary results of this study are presented.