



Het News

Newsletter of the Heteroptera Recording Schemes

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2nd Series

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Editorial: Welcome to the Spring 05 edition of Het News. We have a bias towards terrestrial bugs in this issue but we will endeavour to conjure up some aquatic news for the autumn issue. We welcome an article about the ubiquitous *Nezara* in Japan and we thank all contributors once again for taking the time to provide interesting and varied material.

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What is a True Bug? Bernard Nau

For many years I innocently assumed that the term True Bug referred to the Heteroptera. After all, in 1959 Southwood and Leston called their work on the Heteroptera “Land and Water Bugs of the British Isles”; and to put the matter beyond doubt, the preface begins with the words “The bugs, Heteroptera, form perhaps the ideal group of British insects to study.”

This usage is understandable in as much as the Heteroptera include the Bed Bug, an insect very familiar to the general public in pre-DDT days. Then, a reference to a ‘bug’ would certainly have been interpreted as meaning a Bed Bug. In fact, I have a copy of a lengthy 1942 research report on the ecology of this insect, the research having been requested by a Ministry of Health Committee on the Eradication of Bed-Bugs.

Of late, however, I have noticed a trend for the useful label True Bug to be hijacked to cover Hemiptera as a whole. My theory is that this is down to the Americans. They have long used the term ‘bugs’ to refer to any small creepy-crawly, hence when actually referring to Hemiptera, let alone Heteroptera, they required another label and True Bug is an easy choice. More recently, in British English, the American usage of ‘bugs’ has become widespread in TV, radio and printed press, and so here too there has become a need for an unambiguous term to apply to Hemiptera and the same has happened.

I don’t know when the rot set in but a rapid survey shows that in 1973 Michael Chinnery’s “A field guide to the insects of Britain and northern Europe” applies the term True Bug to the entire Hemiptera, white-flies, aphids and all. Bill Dolling does the same in his 1991 work “The Hemiptera”. Two years later, George McGavin on page 10 of his “Bugs of the World” calls Hemiptera ‘bugs’ and Heteroptera ‘true bugs’. In 2003, Roger Hawkins’ “Shieldbugs of Surrey” (page 10) refers to “Heteroptera, the true bugs”. And, in 2004, The Invertebrate Conservation Trust, also known as “*buglife*”(!), produced a publicity poster which explains that “Bug is also a broad term used for any invertebrate; however, technically the word refers to animals belonging to one order of insects – the Hemiptera.” It then expands this as follows: “true bugs = Heteroptera; hoppers & cicadas = Auchenorrhyncha; aphids, plantlice, whiteflies & scale insects= Sternorrhyncha”.

So there we have it! George McGavin and *buglife* seem to have a good technical solution if we can bear to share the term ‘bug’ with homopterists, but can mere entomologists swim against the media tide?

PS: the *buglife* poster also says that, in the 14th century, ‘bugge’ meant a phantom or goblin, and possibly derived from the Welsh word ‘bwg’ – but we can’t let these people in too!

The Southern Green Shield Bug *Nezara viridula* (L.) expands its distribution range, not only in the U.K.

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When our grandchildren write the history of global warming... the stinkbugs... may not loom large... But our descendants may well decide that it was the long string of such close-to-home observations—the early springs, the shifting ranges of plants and animals, the mortal heat waves—that, more than any climatological data, convinced people that something needed to be done about global warming.

R. Kunzig (2005),
No.1 story of *Discover*
magazine 100 Top Science
Stories of 2004

Nezara viridula is probably 'the-most-often-cited' heteropteran in the world and it is not surprising at all considering its almost cosmopolitan range and the great economic importance of this pest species (Fig. 1). Recently, the interest in this shield bug has increased due to emerging links between spreading of this species and climate warming.

Barclay (2004) and shortly after him Shardlow & Taylor (2004) reported a few colonies of *N. viridula* breeding in London in 2003. Inspections in 2004 showed that some of those colonies survived the winter of 2003/2004 and new colonies were also found (Barclay, pers. comm.). It was only 45 years before that Southwood and Leston (1959) stated that *N. viridula* is 'unlikely to become established' in the British Isles!

The United Kingdom is not the only place on the globe where appearance of *N. viridula* most probably illustrates the on-going climate change. Recently a similar range expansion of this species was reported in central Japan.

In the early 1960s, the northern edge of the range of *N. viridula* was in Wakayama Prefecture (34.1°N) and distribution of this species was shown to be limited by the +5°C mean temperature isotherm of the coldest month (January) (Kiritani *et al.*, 1963). This was because overwintering mortality depends on mean January temperature, a decrease of 1°C results in approximately 15% increase in mean overwintering mortality (Fig. 2). *Nezara viridula* inhabited locations to the south (especially along the oceanic coast), but was absent to the north.



Fig. 1 *Nezara viridula* demonstrates a pronounced case of seasonal body colour polyphenism: it is green in summer (above) and turns brown or reddish when enters diapause in autumn (below) (Photo by the author).

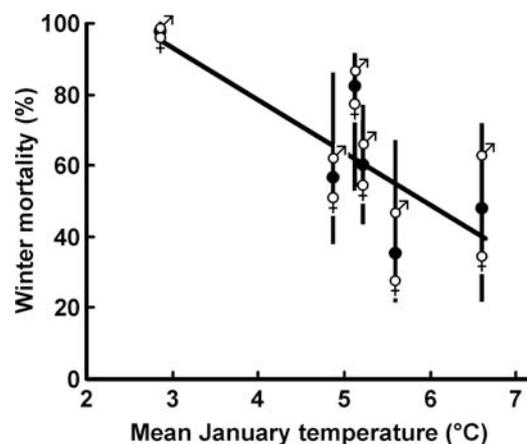


Fig. 2 Winter mortality of *Nezara viridula* adults. Solid circles mean mortality (all adults); symbols of sexes, mortality in corresponding sexes; ranges are the range of mortality in different types of hibernacula (data from Kiritani *et al.*, 1966); linear regression trend line refers to the mean mortality.

Forty years later, *N. viridula* was recorded at least 70 km further north (in Osaka, 34.7°N) and eco-physiological characteristics of the local population were studied with an emphasis on diapause and overwintering (Musolin & Numata, 2003a, b).

Historical climate data (1950–2000) shows that the mean and lowest temperatures of winter months increased by 1–2 °C in Osaka from 1950s to 1990s and winters in Osaka in 1990s became as warm as they were in Wakayama in 1950s (Fig. 3). Thus, warming improved potential overwintering conditions for *N. viridula* in Osaka and promoted northward range expansion of this species. In field experiments under quasi-natural conditions, *N. viridula* showed very high winter survival.

However, overwintering success of insects is determined not only by temperature, but also by proper timing of diapause induction. Laboratory and field experiments showed that in Osaka, adult diapause in this species is induced after mid-September, much later than in local seed feeding heteropterans. This late timing of diapause

induction results in ineffective reproduction in late-season: some females start oviposition in autumn when the progeny have no chance of attaining adulthood and surviving winter, and both reproductive adults and their progeny die before the next season. Thus, it is suggested that *N. viridula* is still, to a certain extent, maladapted to the environmental conditions in Osaka. Further success (or failure) of establishment of this species in the recently colonized area will probably depend on the ability of the species to evolve a lengthening of the critical photoperiod for diapause induction and, consequently, advance the timing of diapause induction. Earlier diapause will allow *N. viridula* to avoid maladaptive reproduction in autumn.

It will be interesting to follow this bug's climatic response in the British Isles.

References

- Barclay, M.V.L., 2004.** The green vegetable bug *Nezara viridula* (L., 1758) (Hem.: Pentatomidae) new to Britain. *The Entomologist's Record and Journal of Variation* **116**, 55–58.
- Japan Meteorological Agency, 2003.** <http://www.data.kishou.go.jp>
- Kiritani, K., Hokyo, N. & Kimura, K., 1966.** Factors affecting the winter mortality in the southern green stink bug, *Nezara viridula* L. *Annales de la Société Entomologique de France, Nouvelle Série (Sunn Pest Memoirs, 9)*, **2**, 199–207.
- Kiritani, K., Hokyo, N. & Yukawa, J., 1963.** Co-existence of the two related stink bugs *Nezara viridula* and *N. antennata* under natural conditions. *Researches on Population Ecology*, **5**, 11–22.
- Kunzig, R., 2005.** Turning point. *Discover*, **26** (1), 26–28.
- Musolin, D.L. & Numata, H., 2003a.** Photoperiodic and temperature control of diapause induction and colour change in the southern green stink bug *Nezara viridula*, *Physiological Entomology*, **28**, 65–74.
- Musolin, D.L. & Numata, H., 2003b.** Timing of diapause induction and its life-history consequences in *Nezara viridula*: is it costly to expand the distribution range? *Ecological Entomology*, **28**, 694–703.
- Shardlow, M.E.A. & Taylor, R., 2004.** Is the Southern Green Shield Bug, *Nezara viridula* (L.) (Hemiptera: Pentatomidae) another species colonising Britain due to climate change? *The British Journal of Entomology and Natural History*, **17**, 143–146.
- Southwood, T.R.E. & Leston, D., 1959.** *Land and Water Bugs of the British Isles*. Frederick Warne and Co., London, 436.

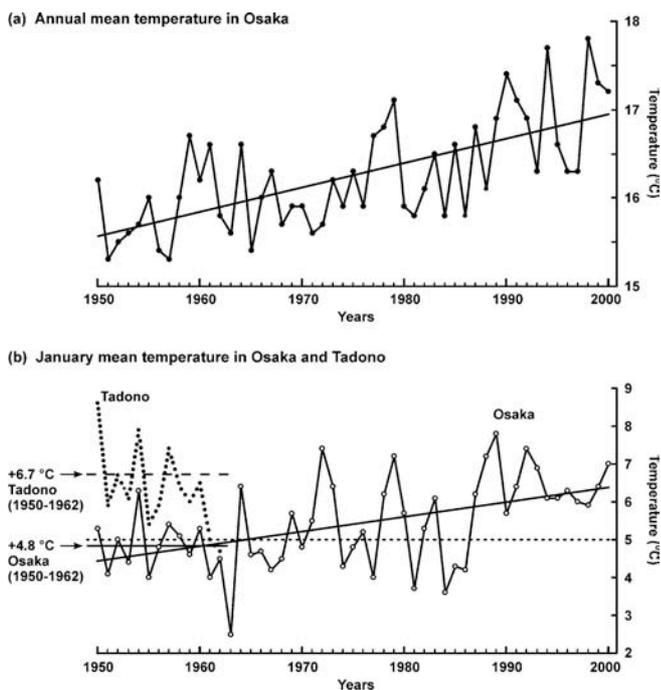


Fig. 3 Changes in air temperature in Tadono (within the range of *Nezara viridula* in the early 1960s in Wakayama) and in Osaka. Annual mean (a) and January monthly mean (b) for Osaka are shown along with linear regression trend lines. Additional lines represent mean January temperatures in Tadono and Osaka for 13 years (1950–1962) preceding the Wakayama range survey and temperature of +5 °C suggested as critical for *Nezara viridula* overwintering (data from Japan Meteorological Agency, 2003) (The figure is partly from Musolin & Numata, 2003b).