

## Book review

**The Fire Ant Wars.** By Joshua Blu Buhs, 2004, 216 pp, University of Chicago Press, Chicago, US\$22.50, ISBN 0-226-07982-1.

The South American red imported fire ant (*Solenopsis invicta*) is one of the worst megainvaders. Its original notoriety stems from its spread through the American South (and the attendant disastrous eradication attempt, termed the ‘Vietnam of entomology’ by E.O. Wilson); more recently it has reached California and Australia. Historian Joshua Blu Buhs describes how this ant arrived, spread, and generated enormous scientific and political controversy. He argues cogently that it was key to transforming an American conservation movement targeting attractive individual species into a full-fledged environmentalism aiming to preserve entire ecosystems.

On the scientific side, Buhs focuses on two main related issues: taxonomy and ecology. Wilson botched the taxonomy early on, viewing the red imported fire ant as but a spreading mutated color variant of an earlier invader, the black imported fire ant (now *S. richteri*), and initially calling both a subspecies of *S. saevissima*. The latter was legendary because the 19th century naturalist H.W. Bates had detailed its devastation of the town of Aveyros in his famed *Naturalist on the River Amazons*. Although Wilson subsequently became skeptical of these assignments, not until the late 1960s was the taxonomy straightened out by William F. Buren and Murray S. Blum, encouraged by William S. Creighton. Buhs has dug up scads of remarkably catty correspondence among these myrmecologists, much of which suggests that their motive was as much to bring Wilson down a notch as to clarify the taxonomy of the invaders. As these notes reflect badly on their authors’ motives but nevertheless impugn Wilson’s early taxonomic skill, it is remarkable that Buhs acknowledges assistance from Blum and Wilson, and it seems particularly noble of Wilson to have written the beautiful and laudatory first blurb on the back cover. It is difficult not to be struck by how all of the principals saved copious amounts of these

casual notes, apparently believing that posterity would cherish them. One wonders in an age of e-mail whether such material will be available to historians.

The ecological issue is whether *S. invicta* is the dreaded juggernaut depicted by the USDA or a harmless new element that will eventually insert itself in some ‘balanced’ way into native communities. This question is intertwined with the taxonomy, because the initial assignment of *invicta* to *saevissima* helped foster the notion that the invader was a horror, owing to Bates’s description. The USDA relied heavily on a 1949 report by Wilson and James Eads, both students, on the impact of the ant in Alabama, and on other of Wilson’s writings to justify the massive chemical eradication attempt begun in 1957. Ironically, though Wilson viewed the ant as a pest, he lambasted the eradication program as a harmful overreaction. Rachel Carson criticized it on the grounds that the ant, as a living entity, would eventually fit into what Buhs calls a ‘balanced natural order’ (p. 114), and also because of her animus towards pesticides. Several southern university entomologists also lined up against the eradication program, not only because they saw it as hopeless; some went so far as to suggest the ant might be, on the whole, beneficial because it attacks other pests.

The eradication forces initially carried the day, however, propelled in Buhs’s view by political ambitions of the USDA Plant Pest Control Division (PPC). In retrospect, the effort was doomed, even aside from the substantial non-target impacts of the intended magic bullets, first heptachlor, then Mirex. The campaign got a reprieve when Richard Nixon, aiming for the southern vote in his 1968 presidential campaign, promised to destroy the fire ant, but the ant was too widely established, and the insecticides probably aided it to compete with native ants. However, it took until the late 1970s for the program to collapse, and the intervening battles are interesting tales, particularly with respect to the toothlessness of the Fish and Wildlife Service and the emergence of the new Environmental Protection Agency

(under President Nixon) as a reluctant antagonist to the USDA. Many important politicians played roles in these wars, not least Texas exterminator and current House majority whip Tom DeLay, who compared the EPA to the Gestapo and helped keep Mirex available long after its dangers were known.

Buhs comes down somewhere in the middle on the actual impact of the fire ant, but his opinion is colored because he espouses the view of environmental historian William Cronon, who sees 'nature' as an essentially human construct. The book is therefore replete with statements about undefined entities, such as how the ant had 'become part of the natural world' (p. 187) and the circumstances that might make it a member of a 'balanced southern ecosystem' (p. 180); in context, it is clear that Buhs is talking very broadly here about the agricultural and suburban South as 'nature.' In fact, *S. invicta* has always thrived in disturbed areas – in the USA, the disturbances that have favored it are all anthropogenic – and has never substantially invaded what most biologists and conservationists would call 'natural areas' (Tschinkel 1993). Buhs notes in passing that this fire ant avoids 'undisturbed wilderness' (p. 180), but his focus on the ant's impact on nature is never on such habitats; rather, it is on human-dominated ones. Thus, for example, with the spread of polygyny (multiple queens per colony), he argues that 'the ant looms as an ever-larger threat to the South's biodiversity' (p. 169). In fact, the ant may become more numerous, but I know of no species whose existence is threatened by

*S. invicta*, largely because it does not substantially invade habitats where imperiled species live.

Buhs treats the biology of this fire ant in detail and is quite up-to-date, with discussions not only of polygyny but of the current biological control effort using decapitating phorid flies. There is an important misinterpretation and consequent omission, however. Buhs apparently believes that, since *S. invicta* and *S. richteri* are separate species, they do not hybridize, and he seems to

impugn the contention of PPC entomologists that such hybrids exist. In fact, there is a large, expanding hybrid zone (Shoemaker et al. 1996; Goodisman et al. 1998; K. Vail pers. comm.). A major advance in understanding this invasion was the development of techniques to distinguish these two species and their hybrids by analyzing their alkaloids and cuticular hydrocarbons (Vander Meer et al. 1985; Ross et al. 1987). The hybridization may be an important component of the spread, and it may affect ecological impacts as well.

In sum, this is a fascinating and highly readable book, the definitive treatment of one of the invasions that produced the field of invasion biology as well as (if Buhs is correct) catalyzed the development of American environmentalism.

## References

- Goodisman MAD, Shoemaker DD and Asmussen MA (1998) Cytonuclear theory for haplodiploid species and X-linked genes. II. Stepping-stone models of gene flow and application to a fire ant hybrid zone. *Evolution* 52: 1423–1440
- Ross KG, Vander Meer RK, Fletcher DJC and Vargo E (1987) Biochemical phenotypic and genetic studies of two introduced fire ants and their hybrid (Hymenoptera: Formicidae). *Evolution* 41: 280–293
- Shoemaker DD, Ross KG and Arnold ML (1996) Genetic structure and evolution of a fire ant hybrid zone. *Evolution* 50: 1958–1976
- Tschinkel WR (1993) The fire ant (*Solenopsis invicta*): still unvanquished. pp 121–136. In: McKnight BN (ed.) *Biological Pollution. The Control and Impact of Invasive Exotic Species*, Indiana Academy of Science, IN, 261 pp
- Vander Meer RK, Lofgren CS and Alvarez FM (1985) Biochemical evidence for hybridization in fire ants. *Florida Entomologist* 68: 501–506

Daniel Simberloff

*Department of Ecology and Evolutionary Biology*

*University of Tennessee*

*Knoxville, TN 37996, USA*

*E-mail: dsimberloff@utk.edu*