(climatic, biophysical) settings. Also, ecological research needs to be conducted to assess eventual interference with or facilitation by local biodiversity. Lastly, a toolbox of tactics is being readied to boost efficacy and abundance of this wasp, particularly in biodiversity-poor cassava monocultures. For other invasive mealybugs, such as *P. marginatus*, fortuitously-introduced parasitoids such as *Acerophagus papayae* appear to provide certain level of control. Nevertheless, focused research is needed to carefully assess the potential of (importation) biological control of each of these pests and investigate for which, if any, natural enemies should be introduced. For some invasive mealybugs, endemic natural enemies could very well provide sufficient pest control services, but essential food, host or shelter opportunities may be lacking in simplified cassava crop ecosystems. In countries where *P. manihoti* is not yet reported, such as India, China and the Philippines, research is urgently needed to build resilience of cassava cropping systems. Work from other crops shows that on-farm biodiversity could be wielded to turn local cassava crops far less susceptible to colonization by invasives. Habitat manipulation can boost the abundance and efficacy of generalist predators and parasitoids, and several other tactics wait to be assessed to keep cassava crops, regions and countries free of some of these destructive pests. In conclusion, arthropod pests have come to severely impact SE Asia's cassava production and collaborative research is needed to secure the long-term sustainability and profitability of this important crop. In the management of several of these invasive pests, an in-depth assessment and meticulous manipulation of on-farm biodiversity undoubtedly will play a central role.

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CLIMATE CHANGE AND SPIDER BIODIVERSITY: REDEFINING ARANEOLOGICAL RESEARCH PRIORITIES

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Among human-induced global changes, climatic ones are the most severe due to their irreversibility. Due to lower thermal tolerance, tropical biotas are particularly vulnerable to climate changes. Species responses to climate change include shifts in elevation, latitude, and phenology, invasiveness, and local or global extinction. With 44,000 described species, spiders are among seven most species-rich animal orders, but our understanding of true spider diversity—estimated at well over 100,000 species—is still incomplete. The ecological importance of spiders as general predators in natural terrestrial ecosystems is undisputed, but spiders also play a major predatory role in agroecosystems, and therefore their diversity is also of economic importance. Nevertheless, spiders are virtually absent from the climate change literature with the exception of a single study predicting widow spider invasiveness. Spider biodiversity research should focus both on natural and human altered environments, and araneologists need to redefine their research agendas in the light of global changes. I argue that a holistic understanding of clade biology and phylogenetic history in addition to species' ecologies, may best help predict the future of any lineage. Integrative studies that combine taxonomic, biodiversity, ecological and phylogenetic research with clade-specific modeling are thus urgently needed to predict the future trends. We are getting closer to understanding past and present global distributions of nephilids, a model clade in spider research. Many of the over 40 species of this pantropical lineage are well-researched behaviorally and ecologically. Taxonomic specimen data, if georeferenced, can easily be utilized in simple models predicting taxon's present and future habitat suitability. We are currently devising habitat suitability GIS models for 2020-2080 for two sister species pairs of the genera *Nephilengys* of SE Asia and Australasia, and *Nephilingis* from the Neo- and Afrotropics, each clade containing one synanthropic species and one habitat specialist. Detailed results of these analyses will be reported elsewhere (M. Kuntner, M. Năpăruş, J.A. Coddington and D. Li, in preparation), but it is already clear that all four species will suffer both dramatic habitat reductions and local extinctions, outweighing the amount of any new ranges. However, predicted habitat losses take different paths and tempos in the four species. We are analyzing precisely how different species are likely to respond to global changes, and to what extent phylogenetic relatedness versus life history predict species ecological preferences, and responses to climatic changes. While phylogeny seems to be predictive of temperature preferences, life history also partially explains species precipitation preferences. Our results imply that even closely related species will cope with climatic changes differently, and such taxonomic specificity may be partially related to the species ecology and partially to genealogy. By understanding contemporary evolutionary patterns and ecological processes we can now focus on models that predict the future of these organisms, a future that is bleak considering anthropogenic global changes.

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BIODIVERSITY, BIOSECURITY AND INTEGRATED PEST MANAGEMENT

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Breaches of biosecurity, leading to incursions by invasive species, have the potential to cause substantial economic, social and environmental losses, including drastic reduction in biodiversity. It is argued that improving biosecurity reduces risk to biodiversity, while maintaining stable ecosystems through biodiversity can be a safeguard against biosecurity breaches. The global costs of invasive alien species (IAS) have been estimated at around US$350 billion, while alien invertebrate and vertebrate pests and weeds are estimated to cost Australia at least $7 billion a year. A striking, current, example is the incursion by Myrtle Rust (*Puccinia psidii*) an organism which can infect all members of the Myrtaceae, the most important family in the Australian flora. Myrtle rust was first detected on a property on the central coast of New South Wales in late April 2010. Two years later the disease has been detected in numerous locations in Queensland and New South Wales ranging from commercial plant nurseries and public amenities to large areas of bushland. This particular breach of biosecurity will, inevitably, diminish biodiversity of flora and fauna over large areas of the continent. Integrated pest management (IPM), an enrichment of diversity in managing invasive and other pest species, offers the best opportunity to address problems such as these. Australia's response to increasing biosecurity risk is comprehensive and includes national networking of scientists engaged in a complex program of biosecurity research and development, including studies of IPM. This network is being enhanced by the development of international linkages.

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Further reading

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