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Importance of pollinators in changing landscapes for world crops

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Article	Figures & Data	Info & Metrics	eLetters	
PDF				

Abstract

The extent of our reliance on animal pollination for world crop production for human food has not previously been evaluated and the previous estimates for countries or continents have seldom used primary data. In this review, we expand the previous estimates using novel primary data from 200

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dependent upon animal pollination, while 28 crops do not rely upon animal pollination. However, global production volumes give a contrasting perspective, since 60% of global production comes from crops that do not depend on animal pollination, 35% from crops that depend on pollinators, and 5% are unevaluated. Using all crops traded on the world market and setting aside crops that are solely passively self-pollinated, wind-pollinated or parthenocarpic, we then evaluated the level of dependence on animal-mediated pollination for crops that are directly consumed by humans. We found that pollinators are essential for 13 crops, production is highly pollinator dependent for 30, moderately for 27, slightly for 21, unimportant for 7, and is of unknown significance for the remaining 9. We further evaluated whether local and landscape-wide management for natural pollination services could help to sustain crop diversity and production. Case studies for nine crops on four continents revealed that agricultural intensification jeopardizes wild bee communities and their stabilizing effect on pollination services at the landscape scale.

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Footnotes

- Electronic supplementary material is available at http://dx.doi.org/10.1098/rspb.2006.3721 or via http://www.journals.royalsoc.ac.uk.
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✓ Previous

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Next >

7 February 2007 Volume 274, issue 1608

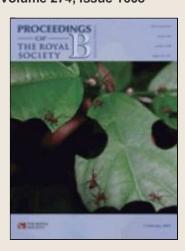
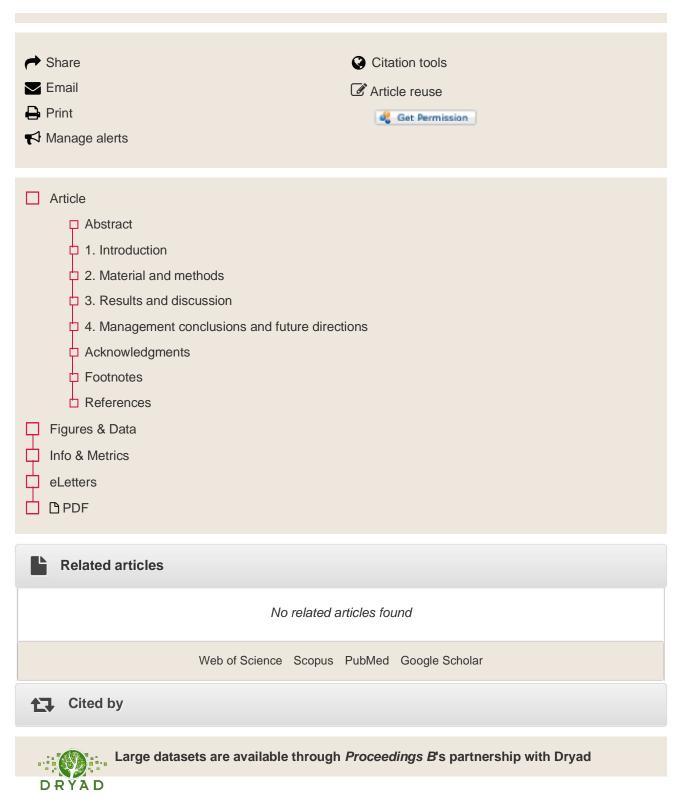


Table of Contents
Table of Contents (PDF)
About the Cover
Index by author
Back Matter (PDF)
Ed Board (PDF)

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Importance of pollinators in changing landscapes for world crops | Proceedings of the Ro... Page 5 of 6

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