Biogeography and Systematics of the Land Snail Genus Acusta Albers, 1850 (Pulmonata: Bradybaenidae) in East Asia

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ABSTRACT

Terrestrial mollusks are ideal experimental models for the studies of phylogeography for their weak dispersal ability. The land snails of the genus Acusta have similar shell morphology so that the taxonomy is difficult and remained in chaotic. Furthermore, some of them are ease to be distributed to other lands by economic activities of human being. The evaluation on the problems caused by exotic species need correct knowledge on taxonomy. Animals of this genus distribute in East Asia from east Siberia cross China, Japan, and Taiwan to eastern Indo-China with a problematic species in Moluccas. Morphological and molecular characters will be used to analyse the population divergence, taxonomy, systematics and the two hypotheses for phylogeographical inferences. Partial 16S rRNA and CO1 genes of mtDNA were sequenced and their phylogenies were reconstructed using neighbor-joining method and the maximum parsimony analysis. Nine major clades were distinguished and were decide as nine possible species. The phylogeny and molecular taxonomy are useful for the phylogeography and quick identification of these widespread land snails.

Keywords : Acusta、taxonomy、biogeography、mitochondrial DNA、relationship

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外表形態與粒線體DNA探討台灣產煙管蝸牛科陸蝸之親緣關係，國立台灣大學動物研究所碩士論文。Avies, J. C. 2000. Phylogeography. Harvard University Press, London.Brown, W. M., M. George, Jr., and A. C. Wilson. 1979. Rapid evolution of animal mitochondrial DNA. Proceedings of the National Academy of Sciences USA 76: 1067-1971..Chiba, S. 1993. Modern and historical evidence for natural hybridization between sympatric species in Mandarina (Pulmonata: Camaenidae). Evolution 47: 1539-1556.Chiba, S. 1997. Novel colour polymorphisms in a hybrid zone of Mandarina (Gastropoda: Pulmonata). Biological Journal of the Linnean Society 61: 369-384.Chiba, S. 1999. Acelerated evolution of land snails Mandarina in the oceanic Bonin Islands: evidence from mitochondrial DNA sequences. Evolution 53: 460-471.Douris, V., R. A. D. Cameron, G. C. Rodakis, and R. Lecanidou. 1998. Mitochondrial phylogeography of the land snail Albinaria in Crete: lomg-term geological and short-term vicariance effects. Evolution 52: 116-125.Felsenstein, J. 1985. Confidence limits on phylogenies: an approach using the bootstrap. Evolution, 39(4): 783-791.Hall, T. A. 1999. BioEdit: a user-friendly biological sequence alignment editor and analysis program for Windows 95/98/NT. Nucleic Acids Symposium Series 41, 95-98.Hausdorf, B. 2000. Biogeography of the Limacoidea sensu lato (Gastropoda: Stylommatophora): vicariance events and long-distance dispersal. Journal of Biogeography 27: 379-390.Hillis,D. M. and C. Moritz 1996. Molecular Systematics. Sinauer Associates, Sunderland, Massachuusetts. U.S.A.Huang, C. Y., W. Y. Wu, C. P. Chang, P. B. Yuan, C. W. L and K. Y. Xia. 1997. Tectonic evolution of accretionary prism in the arc-continent collision terrane of Taiwan. Tectonographysics 281: 31-51.Kimura, M. 2000. Paleogeography of the Ryukyu Islands. Tropics 10: 5 – 24.Kumar, S., Tamura, K., Jakobsen, I. B. and Nei, M. 2001. MEGA2: Molecular Evolutionary Genetics Analysis software. Tempe, Arizona, USA: Arizona State University.Kuroda, T. 1941. A catalogue of molluscan shell from Taiwan (Formosa), with description of new species. Mamoirs of the Faculty Science and Agriculture, Taihoku Imperial University 22(4): 65-216.Kuroda, T. 1959. Land shell fauna of Japan (5). Venus 20: 363-380.Lin, S.-M., C. A. Chen and K.-Y. Lue. 2002. Molecular Phylogeny and Biogeography of the Grass Lizards Genus Takydromus (Reptilia: Lacertidae) of East Asia. Molecular Phylogenetics and Evolution 22: 276-288.Ota, H., M. Toyama, Y. Chigira and T. Hikida. 1994. Systematics, biogeography and conservation of the herpetofauna of the Tokara Group, Ryukyu Archipelago:new data and review of recent publications. WWF Japan Science Report 2(2): 163-177..Pilsbry, H. A. and Y. Hirase. 1906. Catalogue of the land and fresh-water Mollusca of Taiwan (Formosa). Proceedings of the Academy of Natural Sciences of Philadelphia 57: 720-752.Pilsbry, H. 1894. Manual of Conchology (2) 9. Academy of Natural Sciences, Philadelphia, PiladelphiaQian, H., J. S. Song, P. Krestov, Q. Guo, Z. Wu, X. Shen, and X. Guo. 2003. Large-scale phytogeographical patterns in East Asia in relation to latitudinal and climatic gradients. Journal of Biogeography 30: 129-141.Richardson, L. 1982. Bradybaenidae: catalog of species. Tryonia 9: 1-253.Satiou N. and M. Nei 1987. The neighbor-joining methods: a new method for reconstructing phylogenetic trees. Molecular Biology and Evolution. 4:406-425.Thompson, J. D., Higgins, D. G. and Gibson, T. J. 1994. CLUSTAL W: improving the sensitivity of progressive multiple sequence alignment through sequence weighting, position-specific gap penalties and weight matrix choice. Nucleic Acids Research 22, 4673-4680.Tryon, G.W. 1888. Manual of Conchology (2) 4. Academy of Natural Sciences, Philadelphia, PiladelphiaVan Riel, P., Jordaens, K. and Verhagen, R. 2005. Molecular systematics of the endemic Leptaxini (Gastropoda: Pulmonata) on the Azores islands. Molecular Phylogenetics and Evolution 37: 132-143.Voris, H. K. 2000. Maps of Pleistocene sea levels in Southeast Asia: shorelines, river systems and time durations. Journal of Biogeography 27: 1153-1167.Wu, S. K. 1982. Note on Eulota touranensis (Souleyet) (Gastropoda: Pulmonata) of Taiwan. Venus 41:26-32.Zilch, A. 1968. Die Typen und Typoid des Natur-Museums Senckenberg, 41: Mollusca,Bradybaenidae, Bradybaeninae. Archiv fuer Molluskenkunde 98: 155-212.