

TRANSACTIONS
OF THE
ROYAL SOCIETY OF NEW ZEALAND

ZOOLOGY

VOL. 5

No. 1

AUGUST 14, 1964

A Bibliography of the Indigenous Freshwater Fishes of
New Zealand

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[Received by the Editor, February 5, 1964.]

INTRODUCTION

THE object of this bibliography is to facilitate access to reference literature on New Zealand fresh-water fishes. The need for a bibliography arises from the rapid increase in the amount of information being published.

Scope of the bibliography has been restricted to indigenous fishes (including Cyclostomes) which spend a significant part of their lives in fresh-water. The term "indigenous fishes" has been taken to mean those species naturally present in New Zealand, its off-shore islands, the Chatham Islands, and the sub-Antarctic islands of New Zealand. References to fishes which are not restricted to New Zealand (*Geotria australis* Gray, *Galaxias attenuatus* (Jenyns), *Anguilla australis* Richardson) have been included whatever the origin of the specimens or information, because they are relevant to the New Zealand fauna. For this reason a number of the references are of Australian or South American origin. Fishes such as *Aldrichetta forsteri* and *Arripis trutta* which make short term incursions into fresh-water, but which are primarily marine fishes, have been excluded. The introduced fishes comprise a rather distinct area of inquiry and have been covered fairly fully in a previous bibliography (see Bassett, 1961). For this reason they have not been dealt with here.

All known publications making reference to indigenous New Zealand fresh-water fishes have been included. The papers vary in scope from a brief listing or natural history note, to the results of extensive investigations. Several popular works have been included, and some of these, especially the older publications, are of considerable value. Nearly all the items listed were examined by the author. Papers not seen are indicated by "†" adjacent to the publication data—e.g.:

GMELIN, J. F. †1788. *Systema naturae*.

In compiling the bibliography, many titles were located from literature citations in publications dealing with New Zealand fresh-water fishes, but in addition, considerable use was made of the following sources:

The zoological record, 1864–1960. Zoological Society of London.

DEAN, B., 1923. *Bibliography of fishes*. New York, American Museum.

HUTTON, F. W., 1904. *Index faunae Novae Zealandiae*. London, Dulau.

PHILLIPPS, W. J., 1927. *Bibliography of New Zealand fishes*. *Fisheries Bulletin, New Zealand Marine Department*, no. 1.

Published by the Royal Society of New Zealand, c/o Victoria University of
Wellington, P.O. Box 196, Wellington.

BASSETT, D., 1961. *Bibliography of New Zealand fresh-water fishes*. Wellington, New Zealand National Library Service.

At the beginning of the bibliography, a check-list of the species, with synonymies, is given. The synonymies have usually been derived from the most recent systematic work on each species, but only the more significant papers, especially those of systematic importance, have been included.

In the list of titles, authors are listed alphabetically, and the papers of each author are listed in chronological order. Serial publications have been abbreviated following the form given by Smith, W. A., *et al*, 1952: *World list of scientific periodicals, 1900-1950*, London, Butterworth. Books have been cited with title, place of publication, publisher and details of pagination, figures, etc. Each reference is followed by annotations of the fishes mentioned and the type of subject matter contained. An asterisk after the species annotation indicates that the species is described in the paper, and the letter "f", that the species is figured. When a species has been referred to in the paper only by a vernacular name—e.g., kokopu, eel, the annotation given is that of the family to which the fish belongs—e.g., in the above cases, Galaxiidae, Anguillidae, whether or not it appears obvious which species was referred to. The specific names used in many papers have been incorrect, but even where it is obvious that the usage was incorrect, only the name used by the original author has been annotated, and it is left to the individual research worker to decide for himself what the correct usage would have been. Fletcher (1918), for example, records *Galaxias attenuatus* and *G. fasciatus* from Lake Taupo, but it is now known that the only species present there is *G. koaro*. The annotations to Fletcher's paper are nevertheless for *G. attenuatus* and *G. fasciatus*.

Effort has been made to have the annotations suggest the names for which they stand, and, in general, workers familiar with the nomenclature of the New Zealand fauna should be able to recognise from the annotation the species referred to. Two letters have been used for family names (in capitals) and for genus, and in most cases three letters for species annotations; the generic and specific annotations are in Italics. Where the same species name is used for a number of different fish—e.g., *Geotria australis*, *Anguilla australis*, the same annotation has been used in each case for the species name. Where a number of specific names were used in one paper, in reference to a single species—e.g., in synonymies, all the names used in the paper have been annotated, but where several generic names were used for one species, the species annotations occur only under the ruling generic name in that particular paper—e.g., when *Eleotris gobioides* was renamed *Gobiomorphus gobioides* (by Gill, 1863), the annotation for *gobioides* is found under *Gobiomorphus* and not *Eleotris*.

The items in the list of titles are numbered consecutively in the order of their appearance. These numbers have been used to give an index of the titles dealing with each family, genus and species name. Numbers in this index in Italics indicate the more important papers. In the index, the form of the nomenclature annotations is also given adjacent to each name.

Each paper was annotated according to the subject matter contained. These annotations, as listed below, refer to the discussion of the following topics:—

AFFIN.: The affinities of the New Zealand fish groups and relationships within these groups.

CLASSIF.: The familial classification of a species or genus.

DESCR.: The description or re-description of a species.

- DISTR.: The distribution pattern of fishes within a faunal area.
- ECOL.: All aspects of the ecology of the fishes except life history, parasitology, and inter-relationships with the introduced Salmonidae, which are covered under other headings. Factors such as habitat, food and growth are included.
- FOOD.: Utilisation of fishes by man.
- FOSS.: Fossil material.
- GEN.: Subject types which appear too infrequently to allow separate annotation, all publications of a popular nature except those which have particular importance, and papers which contain little significant information.
- LIST.: The entry is part of a faunal list, or the mention is so brief as to provide no further information than a listing.
- L. HIST: Life histories.
- MORPH.: Morphology and structure.
- PARASIT.: Parasitology.
- SALM.: Relationships between native fishes and the introduced Salmonidae.
- SYST.: Nomenclature of the fishes at generic and specific levels.
- ZOOG.: The zoogeography and distribution mechanisms of the New Zealand fauna on a world-wide basis.

In papers not seen by the author, an attempt has been made to give annotations derived from information in later publications which refer back to the papers not seen. These annotations should at least indicate the nature of the paper involved.

ACKNOWLEDGMENTS

The author wishes to thank the librarians of many Wellington libraries who willingly assisted in locating publications, but more especially the librarians at the Turnbull Library, Mrs H. Elliott, of the Fisheries Library, Mrs M. Allehand, Royal Society Library, and Miss M. M. Hall, Dominion Museum Library. Mr J. M. Moreland, Dominion Museum, gave considerable assistance in locating references, and thanks are also due to Mr R. Strahan, School of Biological Sciences, University of New South Wales, for his assistance. I also wish to thank Mr J. F. Podstolski, New Zealand National Library School, for his interest and advice.

LIST OF SERIAL TITLES AND ABBREVIATION

New Zealand Periodicals:

- Ammoh. Bull.* Ammohouse Bulletin.
- Bull. Dom. Mus. N.Z.* Bulletin of the Dominion Museum, New Zealand.
- Bull. N.Z. Bd. Sci. Art.* Bulletin of the New Zealand Board of Science and Art.
- Bull. N.Z. Dep. sci. industr. Res.* Bulletin of the New Zealand Department of Scientific and Industrial Research.
- Bull. Nutr. Res. N.Z.* Bulletin of the Nutrition Research Department of the New Zealand Medical Research Council.

- Comm. Fish. (N.Z.)*. Commercial Fishing.
- Handb. Dom. Mus. N.Z.* Handbook of the Dominion Museum, New Zealand.
- J. Polynes. Soc.* Journal of the Polynesian Society.
- Nat. Educ. (N.Z.)*. National Education.
- N.Z. Aquar. Bull.* Bulletin of the New Zealand Aquarium Society.
- N.Z. Fish. Sh. Gaz.* New Zealand Fishing and Shooting Gazette.
- N.Z. Gaz. Wgton. Spect.* New Zealand Gazette and Wellington Spectator.
- N.Z. Illustr. Mag.* New Zealand Illustrated Magazine.
- N.Z. J. Sci. Tech.* New Zealand Journal of Science and Technology.
- N.Z. J. Sci.* New Zealand Journal of Science.
- N.Z. Mar. Dept. Fish. Bull.* Fisheries Bulletin of the New Zealand Marine Department.
- N.Z. Outdoor.* New Zealand Outdoor.
- N.Z. Sci. Rev.* New Zealand Science Review.
- Post. Pr. Bull (N.Z.)* Post Primary Bulletin.
- Proc. N.Z. Ecol. Soc.* Proceedings of the New Zealand Ecological Society.
- Proc. N.Z. Sci. Congr.* Proceedings of the New Zealand Science Congress.
- Publ. Serv. J. N.Z.* Public Service Journal.
- Rec. Cant. Mus. (N.Z.)* Records of the Canterbury Museum.
- Rec. Dom. Mus. N.Z.* Records of the Dominion Museum, New Zealand.
- Rep. Fish. N.Z.* Annual Report on Fisheries, New Zealand Marine Department.
- Rep. Nth. Cant. Accl. Soc.* Annual Report of the North Canterbury Acclimatisation Society.
- Science Record (N.Z.)*. Science Record.
- Trans. Proc. N.Z. Inst.* Transactions and Proceedings of the New Zealand Institute.
- Trans. roy. Soc. N.Z.* Transactions of the Royal Society of New Zealand.
- Trans. roy. Soc. N.Z. Zool.* Zoology Series, Transactions of the Royal Society of New Zealand.
- Tuatara.* Tuatara.
- Zoo. Pubs. Vict. Univ. Wgton.* Zoology Publications of the Victoria University of Wellington.

Overseas Periodicals:

- Arch. Nat.* Archiv fur Naturgeschichte.
- Arch. neerl. Sci.* Archives Neerlandaises des Sciences Exactes et Naturelles.
- Aust. J. Mar. Freshw. Res.* Australian Journal of Marine and Fresh-water Research.
- Aust. Mus. Mag.* Australian Museum Magazine.
- Aust. Zool.* Australian Zoologist.
- Amer. Nat.* American Naturalist.
- An. Mus. La Plata.* Anales del Museo de la Plata.
- An. Mus. nac. B. Aires.* Anales del Museo Nacional de Historia Natural de Buenos Aires.

- An. Mus. nac. B. Aires, Acta Soc. de Pal.* Anales del Museo Nacional de Historia Natural de Buenos Aires, Acta Sociedad de Palaenotologia.
- Anat. Anz.* Anatomischer Anzeiger.
- Ann. Mag. nat. Hist.* Annals and Magazine of Natural History.
- Bih. svensk Vetensk. Akad. Handl.* Bihang till Kungliga Svenska Vetenskapssakademiens Handlingen.
- Bijdr. Dierk.* Bijdragen tot de Dierkunde.
- Bull. Br. Mus. (Nat. Hist.) Zool.* Zoology Series, Bulletin of the British Museum (Natural History).
- Bull. Soc. philom.* Bulletin de la Societe Philomathique de Paris.
- Bull. U.S. Bur. Fish.* Bulletin of the United States Bureau of Fisheries.
- Bull. U.S. Fish. Comm.* Bulletin of the United States Fisheries Commission.
- Bull. U.S. nat. Mus.* Bulletin of the United States National Museum.
- Comm. Mus. nac. B. Aires.* Comunicaciones del Museo Nacional de Buenos Aires.
- Congr. Pesq. marit. Le Plata.* Congreso Nacional de Pesquerias maritimas e industrias derivadas Le Plata.
- Fish. Newslett. Aust.* Fisheries Newsletter, Australia.
- J. Parasit.* Journal of Parasitology.
- J. Pan-Pacif. Res. Inst.* Journal of the Pan-Pacific Research Institute.
- J. Morph.* Journal of Morphology.
- J. Linn. Soc. (Bot.).* Journal of the Linnaean Society, Botany.
- K. danske. Vidensk. Selsk.* Kongelige Videnskaberres Selskabs Skrifter Kjobenhaven.
- Mem. Aust. Mus.* Memoirs of the Australian Museum.
- Mem. nat. Acad. Sci.* Memoirs of the National Academy of Science.
- Mem. Nat. Mus. Melb.* Memoirs of the National Museum, Melbourne.
- Mem. N.S.W. Nat. Club.* Memoirs of the New South Wales Naturalists' Club.
- Mem. Qd. Mus.* Memoirs of the Queensland Museum.
- Mongr. Biol.* Monographiae Biologicae.
- Pacif. Sci.* Pacific Science.
- Pap. roy. Soc. Tasm.* Papers and Proceedings of the Royal Society of Tasmania.
- Parasitology.* Parasitology.
- Proc. Acad. nat. Sci. Philad.* Proceedings of the Academy of Natural Science of Philadelphia.
- Proc. Linn. Soc. N.S.W.* Proceedings of the Linnaean Society of New South Wales.
- Proc. Pac. Sci. Congr.* Proceedings of the Pacific Science Congress.
- Proc. roy. Soc.* Proceedings of the Royal Society, London.
- Proc. roy. Soc. West. Aust.* Proceedings of the Royal Society of Western Australia.
- Proc. R. zool. Soc. N.S.W.* Proceedings of the Royal Zoological Society of New South Wales.
- Proc. U.S. nat. Mus.* Proceedings of the United States National Museum.

- Nature, Lond.* Nature, London.
- Newsl. Aust. Soc. Limn.* Newsletter of the Australian Society of Limnology.
- Proc. zool. Soc. Lond.* Proceedings of the Zoological Society of London.
- Rec. Aust. Mus.* Records of the Australian Museum.
- Rec. Q. Vict. Mus.* Records of the Queen Victoria Museum, Launceston.
- Rec. S. Aust. Mus.* Records of the South Australian Museum.
- Rep. Br. Ass.* Report of the British Association for the Advancement of Science.
- Salm. Trout. Mag.* Salmon and Trout Magazine.
- S.B. Akad. Wiss. Wien.* Sitzungberichte der Kais Akademie der Wissenschaften in Wien.
- S.B. Ges. naturf. Fr. Berl.* Sitzungberichte der Gesellschaft Naturforschender der Freunde zu Berlin.
- Stanf. ichthyol. Bull.* Stanford Ichthyological Bulletin.
- Tagebl. Int. Zool. Congr.* Tageblatte Internationale Zoologie Congress.
- Tasm. J. nat. Sci.* Tasmanian Journal of Natural Science, Agriculture, Statistics.
- Trans. roy. Soc. Edinb.* Transactions of the Royal Society of Edinburgh.
- Verh. Int. Zool. Congr.* Verhandlung Internationale Zoologie Congress.
- Vict. Nat. Melb.* Victorian Naturalist, Melbourne.
- Zool. Jb.* Zoologischer Jahrbucher.
- Zool. Misc.* Zoological Miscellany.

Expedition Reports:

- CHILTON, C. The Subantarctic Islands of New Zealand, 1909.
- DIEFFENBACH, E. Travels in New Zealand, 1843.
- FILHOL, H. Passage of *Venus*, sur le soliel mission de L'Isle Campbell, 1885.
- FORSTER, G. A voyage round the world, 1777.
- JENYNS, L. The zoology of the voyage of *H.M.S. Beagle* during 1832-1836, 1842.
- JESPERSON, P. Dana reports, 1942.
- KNER, R. Reise der Osterreichischen Fregatte *Novara* um die erde den jahren 1857-59, 1865-7.
- KNOX, G. A. General account of the Chatham Islands 1954 expedition, 1957.
- POOLE, A. L. The New Zealand American Fiordland expedition, 1951.
- REGAN, C. T. Fishes in the British (*Terra Nova*) Antarctic Expedition, 1910.
- REGAN, C. T. Report on the scientific results of the voyage of *S.Y. Scotia*, 1915.
- RENDAHL, H. Papers from Dr Mortensen's Pacific Expedition, 1918.
- STOKELL, G. Cape Expedition series bulletin, 1950.
- WAITE, E. R. Scientific results of the New Zealand Government trawling expedition, 1911.

CHECK-LIST OF SPECIES WITH SYNONYMIES

F. ELEOTRIDAE

Gobiomorphus Gill, 1863

Gobiomorphus alpinus Stokell.

Gobiomorphus alpinus Stokell, 1962.

Gobiomorphus basalis (Gray).

Eleotris basalis Gray, 1842.

Eleotris gobioides Gunther, 1861 (partim).

Gobiomorphus basalis Stokell, 1941.

Gobiomorphus gobioides (Cuv. and Val.).

Eleotris gobioides Cuv. and Val., 1837.

Eleotris gobioides Gunther, 1861 (partim).

Gobiomorphus gobioides Gill, 1863.

Gobiomorphus gobioides Stokell, 1941.

Gobiomorphus huttoni (Ogilby).

Eleotris huttoni Ogilby, 1894.

Gobiomorphus huttoni Whitley and Phillipps, 1940.

Gobiomorphus radiata Stokell, 1941.

Gobiomorphus stokelli Whitley, 1955.

Gobiomorphus huttoni McDowall, 1962.

Philypnodon Bleeker, 1874

Philypnodon breviceps Stokell.

Philypnodon breviceps Stokell, 1940.

Philypnodon hubbsi Stokell.

Philypnodon hubbsi Stokell, 1959.

F. CHEIMARRICHTHYIDAE

Cheimarrichthys Haast, 1874

Cheimarrichthys forsteri Haast.

Cheimarrichthys forsteri Haast, 1874.

F. PLEURONECTIDAE

Rhombosolea Gunther, 1862

Rhombosolea retiaria Hutton.

Rhombosolea tapirina Gunther, 1862 (partim).

Rhombosolea retiaria Hutton, 1874.

Rhombosolea retiaria Waite, 1911.

F. ANGUILLIDAE

Anguilla Shaw, 1803

Anguilla australis schmidtii Phillipps.

Anguilla australis Richardson, 1844-48 (partim).

Anguilla schmidtii Phillipps, 1925.

Anguilla australis orientalis Schmidt, 1928.

Anguilla australis schmidtii Griffin, 1936.

Anguilla dieffenbachii Gray.

Anguilla dieffenbachii Gray, 1842.

Anguilla aucklandii Richardson, 1844-48.

Anguilla latirostris Gunther, 1870.

Anguilla aucklandii Gunther, 1870.

Anguilla waitei Phillipps, 1926.

Anguilla dieffenbachii Schmidt, 1928.

Anguilla aucklandii Schmidt, 1928.

Anguilla dieffenbachii Griffin, 1936.

F. RETROPINNIDAE

Retropinna Gill, 1862

Retropinna chathamensis Stokell.

Retropinna chathamensis Stokell, 1949.

Retropinna lacustris* Stokell.Retropinna lacustris* Stokell, 1943.***Retropinna obtusirostris* Stokell.***Retropinna obtusirostris* Stokell, 1941.***Retropinna osmeroides* Hector.***Retropinna osmeroides* Hector, 1870.*Retropinna richardsoni* Hutton, 1872 (partim)*Retropinna osmeroides* Stokell, 1941.***Retropinna retropinna* (Richardson).***Argentina retropinna* Richardson, 1844-48*Retropinna richardsoni* Gill, 1862.*Retropinna richardsoni* Hutton, 1872 (partim)*Retropinna retropinna* Waite, 1907.*Retropinna retropinna* Stokell, 1941.***Stokellia* Whitley, 1955*****Stokellia anisodon* (Stokell).***Retropinna anisodon* Stokell, 1941.*Stokellia anisodon* Whitley, 1955.**F. APLOCHITONIDAE*****Prototroctes* Gunther, 1870*****Prototroctes oxyrhynchus* Gunther.***Prototroctes oxyrhynchus* Gunther, 1870.*Retropinna upukororo* Hector, 1870.*Prototroctes oxyrhynchus* Hector, 1872.**F. GALAXIIDAE*****Galaxias* Cuvier, 1812*****Galaxias anomalus* Stokell.***Galaxias anomalus* Stokell, 1959.***Galaxias argenteus* (Gmelin).***Esox argenteus* Gmelin, 1789.*Esox alepidotus* Bloch and Schneider, 1801.*Galaxias alepidotus* Cuvier, 1812.*Esox alepidotus* Forster, 1844.*Galaxias alepidotus* Richardson, 1843.*Galaxias forsteri* Cuv. and Val., 1846.*Galaxias grandis* Haast, 1872.*Galaxias kokopu* Clarke, 1899.*Galaxias alepidotus* Stokell, 1949.*Galaxias argenteus* Whitley, 1956.*Galaxias argenteus* Stokell, 1960.***Galaxias attenuatus* (Jenyns).***Mesites attenuatus* Jenyns, 1842.*Galaxias attenuatus* Cuv. and Val., 1846.*Austrocobitis attenuatus* Ogilby, 1899.*Galaxias attenuatus* Regan, 1905.*Austrocobitis attenuatus* Whitley, 1935.*Galaxias attenuatus* Scott, 1936.*Galaxias attenuatus* Stokell, 1949.***Galaxias brevipinnis* Gunther.***Galaxias brevipinnis* Gunther, 1866.*Galaxias robinsoni* Clarke, 1899.*Galaxias huttoni* Regan, 1905.*Galaxias brevipinnis* Stokell, 1954.***Galaxias burrowsius* Phillipps.***Galaxias burrowsius* Phillipps, 1926.*Galaxias burrowsii* Phillipps, 1927.*Saxilaga burrowsius* Scott, 1936.*Paragalaxias burrowsii* Phillipps, 1940.*Galaxias burrowsius* Stokell, 1949.

Galaxias campbelli Sauvage.

- Galaxias campbelli* Sauvage, 1880.
Galaxias bollansi Hutton, 1901.
Galaxias brevipinnis Regan, 1905.
Galaxias brevipinnis Waite, 1909.
Galaxias campbelli Stokell, 1950.

Galaxias divergens Stokell.

- Galaxias divergens* Stokell, 1959.

Galaxias fasciatus Gray.

- Galaxias fasciatus* Gray, 1842.
Galaxias fasciatus Regan, 1905.
Galaxias argenteus Whitley and Phillipps, 1940 (partim).
Galaxias fasciatus Stokell, 1949.

Galaxias kaikorai Whitley.

- Galaxias kaikorai* Whitley, 1956.

Galaxias koaro Phillipps.

- Galaxias huttoni* Phillipps, 1924.
Galaxias brevipinnis Phillipps, 1940.
Galaxias koaro Phillipps, 1924.
Galaxias koaro Stokell, 1949.

Galaxias lynx Hutton.

- Galaxias lynx* Hutton, 1896.
Galaxias castlae Whitley and Phillipps, 1940.
Galaxias lynx Stokell, 1949.

Galaxias paucispondylus Stokell.

- Galaxias paucispondylus* Stokell, 1938.

Galaxias postvectis Clarke.

- Galaxias postvectis* Clarke, 1899.
Galaxias charlottae Whitley and Phillipps, 1940.
Galaxias postvectis Stokell, 1960.

Galaxias prognathus Stokell.

- Galaxias prognathus* Stokell, 1940.

Galaxias vulgaris Stokell.

- Galaxias vulgaris* Stokell, 1949.

Neochanna Gunther, 1867

Neochanna apoda Gunther.

- Neochanna apoda* Gunther, 1867.
Neochanna apoda Stokell, 1949.

Neochanna diversus Stokell.

- Neochanna diversus* Stokell, 1949.

F. GEOTRIDAE

Geotria Gray, 1851

Geotria australis Gray.

- Petromyzon* sp. Grant, 1846.
Geotria australis Gray, 1851.
Velasia chilensis Gray, 1851.
Thysanochilus valdivianus Troschel, 1857.
Petromyzon macrostomus Burmeister, 1868.
Geotria chilensis Gunther, 1870.
Geotria allporti Gunther, 1870.
‡*Yarra singularis* Castelnau, 1872.
‡*Neomordacia howittii* Castelnau, 1872.
Exomegas macrostoma Gill, 1883.
Geotria macrostoma Berg, 1893.
Neomordacia howittii Ogilby, 1896.
Velasia stenostomus Ogilby, 1896.
‡*Yarra singularis* Ogilby, 1896.
‡*Macrophthalmia chilensis* Plate, 1897.
‡*Exomegas macrostomus* Berg, 1899.
‡*Geotria australis* Dendy and Olliver, 1901

Geotria chilensis Plate, 1902.

Geotria stenostomus Waite, 1904.

Geotria australis Regan, 1911.

Geotria chilensis Regan, 1911.

Geotria stenostomus Regan, 1911.

Geotria saccifera Regan, 1911.

Geotria australis Strahan, 1959.

‡ These two synonymies are regarded as uncertain by Strahan (pers. comm.).

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F. PLEURONECTIDAE.
Rhombosolea Gunther.

PL.
Rh.

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R. retiaria Hutton. Rh ret.
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An.

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