



INTERNATIONAL ASSOCIATION
OF ASTACOLOGY
I.A.A.

NEWSLETTER OF THE INTERNATIONAL ASSOCIATION OF ASTACOLOGY

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NEW ADDRESS FOR IAA & NEWSLETTER--I have taken a new post as Director of the Crawfish Center at the University of Southwestern Louisiana. As a result, readers are requested to forward correspondence and phone calls to the following address and phone number: Crawfish Center, P.O. Box 44650, University of Southwestern Louisiana, Lafayette, Louisiana 70504 USA; Phone, (318) 231-5239. Jay V. Huner.

PIERRE LAURENT IN RECUPERATION--Past President Pierre Laurent and his wife Monique were seriously injured in a traffic accident in September of this year. They are, fortunately, recuperating now at home. I am sure that all members join with me in wishing them a rapid recovery. Jay Huner.

STATUS OF DIRECTORY OF ASTACOLOGISTS--The Directory is being typed now and will be duplicated for mailing during January 1989.

NATURE OF NEWSLETTER--There are those who, rightfully so, have suggested that the newsletter might better be done by a professional printer. Your officers and newsletter editor agree. The problem amounts to one of fiscal responsibility. With dues amounting to approximately \$US 11 per year, we simply cannot upgrade the newsletter without at least doubling dues. Likewise, if we were to print the newsletter on standard sized paper, we would increase its cost of duplication and mailing by a factor of 3 to 4. We have chosen to keep IAA dues at a minimum to maximize service to membership and will continue to follow that policy unless the general membership indicates a desire for a change.

FRESHWATER CRAYFISH VII: A JOURNAL OF ASTACOLOGY--Editor Pierre Goeldlin has informed us that price will be approximately 60

Swiss Francs. For more information, contact Prof. Goeldlin in care of: Musee Zoologique, Place Riponne 6, Case Postale 448, CH-1000 Lausanne 17, Switzerland.

IAA CO-SPONSORS THE ANNUAL MEETING OF THE AMERICAN SOCIETY OF ZOOLOGISTS ET AL.--IAA President Jim Payne will be the official IAA representative at the ASZ et al. meeting scheduled for December 27-30, 1988 at the San Francisco (California, USA) Hilton On Hotel.

AQUACULTURE LOS ANGELES '89 CONFERENCE--IAA will be a "minor" co-sponsor of this meeting scheduled for 12-16 February 1989 in Los Angeles, California USA. IAA is also co-sponsoring a special session on crayfish culture and topics are: (1) Historical Overview of Crawfish Culture Intensification; (2) European Crawfish Culture Intensification; (3) Australian Crawfish Culture Intensification; (4) New Advances in Crawfish Forage Management; (5) Intensification of Crawfish Culture with Supplemental Feeds; and (6) Potential for Genetic Improvement in Crawfish Culture. There will be approximately 15 additional papers (oral and poster) dealing with various aspects of crayfish culture and biology during the course of the conference. For more information, contact: Aquaculture '89, c/o Crest International, 940 Emmett Avenue, Suite 14, Belmont, California 94002. Phone (415) 595-2704.

INTERNATIONAL CRAWFISH TASTING AND TRADE SHOW/ANNUAL MEETING, LOUISIANA CRAWFISH FARMERS' ASSOCIATION--9/10/11 February 1989--This annual event will be held in and around Lafayette, Louisiana USA. A tour of the crawfish industry will be conducted on 9 February. Participants will see crawfish farms, soft-shell crawfish production units, crawfish processing plants, and crawfish restaurants. The annual LCFA meeting will be held during the day on 10 February and will feature a repeated, simultaneous seminar format. About 20 different seminars dealing with everything from basic biology to market development will be presented. LCFA members are admitted at no charge (membership is \$US 30 per year). The International Crawfish Tasting and Trade Show begins on the evening of 10 February for those participating in the LCFA meeting and continues from mid-morning to mid-evening on the 11th of February. Educational and commercial exhibits as well as food booths, cooking demonstrations, and cajun music will afford visitors with non-stop information and entertainment. Send inquiries to the Louisiana Crawfish Farmers' Association, P.O. Box 91544, Lafayette, Louisiana 70504 USA. The phone number for LCFA is (318) 235-7072.

EIGHTH SYMPOSIUM OF ASTACOLOGY, APRIL 1990--It is not too early to start thinking about our nexts international IAA meeting. The Eighth Symposium of Astacology is scheduled for mid-April 1990 in the heart of Louisiana crayfish country, Baton Rouge. IAA's host will be the Louisiana State University Agricultural Center. Co-organizers are Board Member L. W. de la Bretonne, Jr. and Robert P. Romaine. Addresses and phone numbers are: de la Bretonne, Louisiana Cooperative Extension Service, Knapp Hall-Louisiana State University Agricultural Center, Baton Rouge, Louisiana 70803 USA/(504) 388-4141 and Romaine, School of Forestry, Wildlife & Fisheries, Louisiana

State University, Baton Rouge, Louisiana 70803 USA/(504) 388-4208.

CHINESE ASSOCIATION OF ASTACOLOGY--IAA member Shu Xinya (Hubei Fisheries Science Research Institute, No. 18 Donghu Road, Wuhan, People's Republic of China) writes that "...We hope that the Chinese Association of Astacology would be established...." Mr. Shu is hopeful that the CAA would be affiliated with IAA and he has been referred to President Payne for further communications. Furthermore, the purpose of the CAA is to foster utilization of China's monumental crayfish resource, mostly Procambarus clarkii which, until recently, has often been considered to be a pest making dike threatening holes. Utilization of the crayfish would lead to wise utilization of this resource.

BRITISH CRAYFISH INDUSTRY EXAMINED--Member A. G. Thompson (15 Meadoway, Church, Accrington, Lancashire, England) sent a summary of his undergraduate project - The British Crayfish Industry: Development, Problems and Potential. Mr. Thompson is willing to send a copy of the project on loan to interested readers but stresses that he does not have the resources to provide gratis copies of his 200 page plus study. The summary itself is too long for inclusion in this newsletter but is well worth reading and stresses the importance of marketing a product in a region where there is little history of its consumption. Mr. Thompson also covers the topic of introductions pointing out the dangers associated with such activities. This is most appropriate as the British crayfish industry is based on the introduced Pacifastacus leniusculus.

THOMPSON SEEKS POSITION--A. G. Thompson (address immediately above) is seeking "a challenging position in crustacean aquaculture..." He "...would be pleased to consider any possibilities, from any country...."

PROCEEDINGS OF THE FIRST AUSTRALIAN SHELLFISH CONFERENCE, PERTH, 1988. This meeting held from 23-27 October 1988. The completed proceedings number over 390 pages and include 37 papers of which 3 appear only as abstracts. Papers of specific interest to astacologists include: (1) Soft Shell Crawfish Industry by Jay Huner; (2) Marron Farming - Current Industry and Research Developments in Western Australia by Noel Morrissy; (3) Aquaculture Potential of Cherax quadricarinatus: Research Objectives and Preliminary Results by Clive Jones; (4) Breeding Biology of Cherax quadricarinatus by Nathan Sammy; (5) Co-operative Marketing of Signal Crawfish in the United Kingdom by Ms. M. Richards; (6) The Australian Mystique-Giant Crayfish or Freshwater Lobsters, by A. W. Smith; Parasitoid Research at the University of Western Australia by B. Knott and B. O'Brien; and (7) Effects of salinity on growth in Cherax destructor by B. J. Mills and M. C. Geddes. Copies of the 390 page book are available through Dr. Louis M. Evans, School of Medical Technology, Curtin University of Technology, Curtin University of Technology, GPO Box U1987;

CRAYFISHES STUDIED IN CHILE--Erich Rudolph is professor in the Departamento de Ciencias Exactas Y Naturales, Instituto Profesional

de Osorno, Chile. He has recently sent several papers that deal with his studies of the parasitoid fauna of Chile. One paper compares the suitability of the following species for aquaculture: Samanitacus spinifrons, Parasitacus nicolei, and Cryphiops caementarius. The reference and two others are presented below in the Recent Literature section. It appears that S. spinifrons has excellent potential for culture. It would certainly be advisable to thoroughly examine local species for cultivation before introducing ANY exotic species to Chile.

EXPLOITATION OF Orconectes rusticus IN THE GREAT LAKES REGION OF NORTH AMERICA--Members Walter Momot (Dept. of Biology, Lakehead Univ., Thunder Bay, Ontario, Canada) and Bob Pagel (217 W. Liberty St., Deerfield, Wisconsin USA) have sent several newspaper clippings about the development of "rusty" crayfish fisheries in Minnesota and Wisconsin (see related article below). Much of the interest seems to be related to selling precooked crayfish to Swedish entrepreneurs for the traditional August/September crayfish parties in Sweden. An order for at least 100 tons is said to have been made. This situation developed because Louisiana crayfish processors could not meet contract commitments for this past summer. In addition, rusty crayfish are said to be more attractive because they more closely resemble noble and signal crayfishes than do red swamp crayfish from Louisiana (and elsewhere). The principal problem on the US side of the border is that a relatively small percentage of the crayfish actually reach the desired gourmet size so that a crayfish peeling industry needs to be developed but probably will not until a practical peeling machine is available. On the Canadian side of the border, the problem is one of conservatism with little interest being shown in developing the resource.

MAJOR CRAYFISH FISHERY STUDY IN WISCONSIN--This study was conducted by Mehar Arora and Don Wik (University of Wisconsin-Stout, Menomonie, Wisconsin 54751 USA). It includes over 240 pages of text. The reference is: Arora, Mehar and Don Wik. 1988. Feasibility Study for Resolving the Crayfish Problem in Northern Wisconsin. University of Wisconsin-Stout, Menomonie, Wisconsin USA, August 1, 1988. Chapters include: I. Project Goals; II. Literature Review; III. Mathematical Models; IV. Crayfish Supply and Demand; V. Field Studies; VI. Feasibility: Commercial Crayfish Processing in Wisconsin; VII. Summary, Conclusions and Recommendations. This is probably the most exhaustive crayfish survey that your editor has seen and justice cannot be done to it in this newsletter. It is clear, however, that the state of Wisconsin does have a very significant crayfish resource in Orconectes rusticus and is serious about developing a use for it.

Procambarus clarkii THE FISH HATCHERY CONNECTION AND ASTACOLOGICAL NEWS FROM OHIO USA!--Member Jim Norrocky (Rt. 1, Vickery, Ohio 43464 USA) has done much to further the study of astacology in the midwestern USA strictly as an avocation as he earns his living as a builder! He writes that while traveling through northwestern Kentucky he collected P. clarkii at a state fish hatchery on the Rowan/Bath County line. The Clark Hatchery is near Route 519, about

11 km southwest of the town of Morehead. The manager said that they came in with some fish from the state of Arkansas. Jim notes "It would seem that there are many, many hatcheries through the country that have received P. clarkii in this manner."

Jim also notes that the Ohio Department of Natural Resources has met to develop a long range plan to manage several nongame species, crayfish included. An update will be included when received from Jim.

INFORMATION ABOUT Procambarus clarkii IN PORTUGAL--Member M. Margarida Nenezes-Ferreira (Department of Biology, Universidade de Evora, Apartado 94, 7001 Evora Cedex, Portugal) writes, "...as to this date, there is little information about population dynamics of P. clarkii in the areas where it was located, namely the south-east province of Alentejo. Also, there is no market value established for this species because there is no defend market at all. Nevertheless, due to the large number of animals captured it is now highly consumed locally and may become an interesting market to be created. To my knowledge there is another group working on this subject in Portugal, from the Department of Forests of the Ministry of Agriculture."

Procambarus clarkii SECURELY ESTABLISHED IN FRANCE--Member Jacques Arrignon (24, Rue de la Huitieme Division, F-60200 Compiègne, France) has sent information about P. clarkii in France. It has been established in L'etang de Sarcelles near Paris where it is fished from May to November. The catch in this small pond of 2 ha is between 1 to 2.1 metric tons per year.

LOUISIANA FARM-RAISED CRAWFISH PRODUCTION STATISTICS, 1981-87--Source is Kenneth J. Roberts & C. David Harper (Louisiana Cooperative Extension Service, Louisiana State University, Baton Rouge, Louisiana 70803 USA).

Year	Acres	mil. pounds	Av./Acre	Val.\$ mil.	Price/pound
1981	58,123	31.7	545	26.7	0.84
1982	65,927	43.3	657	35.0	0.81
1983	100,688	69.5	691	33.1	0.48
1984	103,622	65.6	633	27.6	0.42
1985	102,088	65.0	637	29.4	0.45
1986	118,540	66.1	557	33.1	0.50
1987	129,867	71.7	552	32.3	0.45

DISTRIBUTION OF Procambarus clarkii IN MEXICO--Prof. Ernesto Campos (Universidad Autonoma de Baja California, Escuela Superior de Ciencias, Apartado Postal 2300, Ensenada, Baja California, Mexico) has sent a Spanish language manuscript dealing with the distribution of P. clarkii in Mexico. While the manuscript is in the review process, the information is pertinent to astacologists and a brief summary is provided here. The paper covers 21 new localities for the species in Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas. Its preferred habitat is lotic (73%), with turbid water (75%). The main substrate is mud. The natural range is thought

to be the central Rio Bravo (Rio Grande) (including the Rio Salado), in the states of Coahuilla, Nuevo Leon and Tamaulipas. It appears that the species was introduced in the Rio Conchos, Chihuahua, as well as in the Rio San Juan sub-basin in Nuevo Leon. It is clearly an exotic in Baja California and Sonora having been introduced there from exotic populations in Arizona, California or Nevada in the USA. Additional information about the species in Sonora may be obtained from Biol. Jose R. Campoy-Favela, Centro Ecologico de Sonora, Paseo de la Rivera 17, Col. Valle Grande, Hermosillo, Sonora, Mexico.

Procambarus clarkii AND OTHER CRAYFISHES IN ITALY--Member Alessandro Mancini (Via Flaminia 12, 00068 Rignano Flaminio (Rome), Italy) sends the following information.

"I have no information about wild populations of P. clarkii in Italy. This species has been sometimes imported by wholesalers and some research institutes...from Kenya and Spain, but only for sales in fish-markets or for breeding experimentations in controlled areas.

"...P. clarkii is much requested by the Italian aquarium enthusiasts. In Italy, its sale prices is very high: about 6,500 Lit (4.60 \$) wholesale, and also at retail price of 20,000 Lit (about \$15.00 \$) for a single specimen!

"The high price is caused by the fact that it is imported from Hong-Kong only, where maybe there are small farms. This country sells them very irregularly and in limited quantities: every year in Italy there are sold 3,000-4,000 specimens of P. clarkii, but demand is much higher...Since this crayfish easily breeds in aquariums, I think there are many possibilities that it could be introduced in Italian waters by some aquarium keepers.

"From an alimentary point of view it isn't, in fact, much loved by Italian consumers and, presently, the attempts of breeding in Italy mainly involve P. leniusculus (in Lombardy) and, for restoration, A. pallipes (some Provincial and Regional fish farms). Italy still imports from Turkey A. leptodactylus. These stocks nearly always arrive infected by plague and other diseases. A wholesaler of Rome also tried to import C. destructor (yabbie), but the specimens arrived from Australia in such physical condition that they could not be sold.

"About P. leniusculus, the most interesting crayfish for the Italian market, its importation to Italy (from USA or Sweden) is too high.

"Presently, the retail price of crayfish in Italy (mainly living A. leptodactylus) is about 15-18 \$ per kg."

Procambarus clarkii IN EASTERN AFRICA--IAA member C. Marcus French (P.O. Box 40813, Nairobi, Kenya) sends the following information:

"Lake Malvasha (Kenya): What little information I have is that as a result of especially long and heavy rains this year the level has risen. However, I can get no details on the Crayfish yield or population....

"Uganda: Further investigations have shown that there are indeed Procambarus clarkii to the north of Kampala in Lake Kyogi but very few. Occasional specimens have been caught in other areas. None so far from Lake Victoria.

*However, Lake Bunyoni (formerly Lake Albert???) some 300 kilometers from Kampala has a good stock. We estimate a production of up to one metric ton a week could be achieved without destroying the population.

"The Ugandan Government is now aware of their existence and possibilities but fears their effect on other fresh water fish populations. Therefore, they will not consider stocking other natural areas. They might agree to farming if adequate precautions against escape and damage from burrowing can be negotiated.

"Unfortunately Lake Bunyoni is in a poor security area and the cost of guarding stock and transport is therefore too high. At present only ex-military personnel are prepared to take the risk but they demand high rates of pay, so exploitation, except for stocking other areas is uneconomical."

EFFECTS OF AERIAL EXPOSURE TO Procambarus clarkii--Member Brian McMahon (Department of Biological Sciences, University of Calgary, Calgary, Alberta, Canada T2N 1N4) has a long history of studying the responses of crustaceans, especially cool water crayfishes, to stresses such as aerial exposure. As there is little information available about the responses of warm water crayfishes especially burrowing species like P. clarkii, it seems appropriate to include information about a recent poster presentation that Brian made at the Congress of Physiology and Biochemistry in August 1988 in Baton Rouge, Louisiana. RE: McMahon, B. R. and S. A. Stuart. Respiratory Consequences of Chronic Air Exposure in Procambarus clarkii.

"Most red swamp crayfish Procambarus clarkii survive 28 days exposure to humid air and at least 7 days under conditions of slow dehydration. Postbranchial hemolymph oxygen partial pressures are highly variable but are often elevated in air, particularly following dehydration. Prebranchial oxygen pressures are routinely low (3.3 1.6 (SD) torr) in water and unaffected by air exposure. Hemolymph PCO2 levels initially increase dramatically (PACO2 from 4.9 1 to 21 7.8 torr) on exposure to humid air but stabilize after 12h. An initial, largely respiratory, acidosis (pHA from 7.636 to 7.463) results, but is compensated within 3 days. Neither lactate nor ammonia levels build up significantly in hemolymph. Recovery occurs rapidly on return to water. Procambarus clarkii is clearly well able to obtain oxygen from air and routinely enters air voluntarily when observed in an artificial burrow system."

Pacifastacus leniusculus IN EAST AFRICA--Your editor has received unconfirmed reports that P. leniusculus has been imported into Zimbabwe for cultural purposes. Additional information will be presented as it arrives.

RESTORATION OF Astacus astacus IN FRANCE/THE FINNISH CONNECTION--Past Presidents Pierre Laurent and Ossi Lindqvist have collaborated to arrange for the shipment of A. astacus from Prof. Lindqvist in central Finland to Prof. Laurent for restoration work in central France (Parc Naturel Regional de Lorraine). Some 1,000 adult male and female crayfish were shipped to France.

Psorosperium COMMON IN CENTRAL FINLAND POPULATIONS OF Astacus

astacus--Past president Ossi Lindqvist (Department of Applied Zoology, University of Kuopio, Kuopio, Finland) writes that he has now found a high incidence of Psorosperium haeckeli in several populations of A. astacus in ponds in and around Kuopio in central Finland. He speculates that the "parasite?" is probably much more common than previously thought simply because no one looked for it. This follows after reports about P. haeckeli in Texas Procambarus clarkii populations and in Canadian Orconectes virilis populations.

NEWS ABOUT YABBIES FROM AUSTRALIA--IAA member John Mosig (Australian Yabbie Farms Pty. Ltd., P.O. Box 270, Euroa, Victoria 3666, Australia) has forwarded the following news release:

"Australian Yabbie Farms of Euroa, Victoria have been very pleased with the results of their first harvest. Although only 4 Hectares of ponds were utilized in a pilot scheme the much maligned yabbie (Cherax destructor) has proven that it is a real aquaculture giant.

"After years of hard slog the team at A.Y.F. face the coming season with great confidence."

SWEDISH CRAYFISH DISSERTATIONS--The following dissertations recently arrived from Sweden: (1) Johansson, Mats. 1988. Cellular Defence reactions of crayfish blood cells in vitro. Acta Univ. Uppsala, Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science 163. 43 pp. Uppsala. ISBN 91-554-2271-3. A listing of the various papers on which the dissertation was based is listed in the Recent Literature section below. Crustaceans studied included: Astacus astacus, Carcinus maenas, and Pacifastacus leniusculus. Dr. Johansson's advisor was IAA member Kenneth Söderhäll. (2) Odelström, Tommy. 1988. The Food Choice of the Crayfish Astacus astacus L. in Relation to Environmental Conditions. Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science 165. 13 pp. Uppsala. ISBN 91-554-2282-9. A listing of the various papers on which the dissertation was based is listed in the Recent Literature section below. Animal protein was found to be especially important to stimulating rapid growth. Odelström is a long time IAA member. Congratulations to him.

TAXONOMICAL NOTES FROM HORTON H. HOBBS, JR. Procambarus--Dr. Hobbs (NHB Stop 163, Smithsonian Institution, Washington, DC 20560 USA) writes that he is working with representatives of three species of Procambarus from Texas (USA) which have been misidentified as Procambarus acutus acutus. He has completed the illustrations for one species from the Neches River Basin and is working on illustrations for the other two species. One of the latter species was the form that D. Albaugh had based a life history study and had identified as P. a. acutus.

SOFT-SHELL CRAWFISH NEWS FROM MANY SOURCES--(1) There are currently two U.S. soft-shell crawfish associations. These are: the Louisiana Soft-Shell Crawfish Association, P.O. Box 80125, Baton Rouge, Louisiana 70898 USA (Dues are \$US 20 per year.) and the National Soft Shell Crawfish Association, 10985 N. Marrell's Ferry Road, Baton Rouge, Louisiana 70816 USA (Dues are \$US 175 per year). (2)

Attractive 4-color brochures about soft-shell crawfish are available from two sources including: Louisiana Seafood Marketing and Promotion Board, 2000 Quail Drive, Baton Rouge, Louisiana 70810 USA and Handy Soft Shell Crawfish, 10557 Cherry Hill Avenue, Baton Rouge, Louisiana 70816 USA. (3) A very useful, 4-color illustrated article about soft-shell crawfish is: Cotton, C. Richard. 1988. Soft Crawfish Are A Seafood Sensation: The Hard Sell of the Soft Shell. Seafood Leader Magazine Fall 1988, 8(4):90-100. (4) Information sheets on soft-shell crawfish production have appeared outside of Louisiana, still the dominant source, in South Carolina and Mississippi. References are: Whetstone, Jack. 1988. Softshell Crawfish Update. South Carolina Aquaculturist. July 1988, No. 88-1, pp. 7-8. Clemson University Cooperative Extension Service, Clemson, South Carolina 29631 USA. Homziak, Jurij. 1988. Producing Soft Crawfish. Is It for You? For Fish Farmers, Sept. 1988, No. 88-2, pp. 7-10. Mississippi Cooperative Extension Service, Mississippi State University, Mississippi State, Mississippi 39762 USA.

RECENT LITERATURE--

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NEW MEMBERS JULY 1988 - NOVEMBER 1988

GREAT BRITAIN

1. F. M. Slater, Llysdinam Field Centre, Newbridge on Wye, Llandrindod Wells, Powys LD1 6NB.

PORTUGAL

1. Margarida Menezes-Ferreira, Department of Biology, Universidad de Evora, P.O. Box 94, 4001 Evora.

SWEDEN

1. Klas Horndahl, Scandinavian Horndahl Company, Box 91, S-601.03 Norrköping.

USA

1. Peter L. deFur, Department of Biological Sciences, P.O. Box 814, Southeastern Louisiana University, Hammond, Louisiana 70402.
2. Freshwater Crayfish Limited, 2509 West Superior Street, Duluth, Minnesota 55806 (Contact Ken Kalligher).
3. Jay Huner, Crawfish Center, P.O. Box 44650, University of Southwestern Louisiana, Lafayette, Louisiana 70504.
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5. Charles Shivers, 303 N. Lincoln, Corydon, Iowa 50060.
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1. C. M. Austin, c/- Fercom Aquaculture, P. O. Box 797, Hoberly, Missouri 65270.

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