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3. **Freshwater crayfish V** (1983) - Van Nostrand Reinhold, 115 Fifth Avenue, New York, New York 10003, USA. Cost is approximately US\$ 35 plus postage and handling. Check for exact price.

4. **Freshwater crayfish VI** (1986) - Prof. Per Brinck, Ecology Building, University of Lund, S-223 62 Lund, Sweden. Cost is US\$ 30 plus US\$ 5 surface postage.

5. **Freshwater crayfish VII** (1988) - Prof. Pierre Goeldlin, Directeur du musse Zoologique, 6 Place de Riponne, CH-1005 Lausanne, Switzerland. Cost is 63 Swiss francs.

6. **Freshwater Crayfish VIII.** The manuscripts for Freshwater Crayfish VIII are being reviewed and publication is on-line in the coming year according to the editors.

7. **Freshwater Crayfish.** Some members have indicated a desire to obtain a complete series of Freshwater Crayfish, A Journal of Astacology. Anyone wishing to sell/purchase copies, especially of Vol. II and III, should contact the Secretariat so that the information may be presented in this newsletter.

IAA lapel pins & 1990 symposium posters

Attractive IAA Lapel Pins are available to members at the basic cost to the association - \$4.00 each including air mail postage. The IAA Symposium Poster, 4-color is available for \$15.00 each including air mail postage. Direct orders in US dollars to the IAA Secretariat, Box 44650, Univ. of SW Louisiana, Lafayette, Louisiana 70504, USA.

IAA membership

Membership is open to anyone or any firm with a strong interest in astacology. Membership cost is for regular members US\$ 25, students US\$ 12.50 and business members US\$ 50. Those with monetary exchange problems may petition the secretariat for a reduction in dues to US\$12.50 for regular dues or no dues. A statement that demonstrates keen interest in and contributions to astacology must accompany any request for reduced dues or no dues. The dues are for the period between the international symposia, i.e. from April 1990 - April 1992. Do not hesitate to join the IAA, all members are sent back newsletters and any other mailings for the whole membership period. This means you get full credit for your dues whenever you join. Application for membership should be sent to the IAA Secretariat, P.O.Box 44 650, Univ. of Southwestern Louisiana, Lafayette, Louisiana 70 504, USA, phne (318) 231-5239 / fax (318) 231-5395.

In England and Norway it is possible to pay in local currency by contacting D. Holdich (Department of Zoology, University of Nottingham, Nottingham NG7 2RD, England) and J. Skurdal (Eastern Norway Research Institute, P.O.Box 1066 DSkurva, N-2601 Lillehammer, Norway) respectively.



Crayfish NEWS

IAA Newsletter

Volume 13, Number 4 November 1991

IAA

The International Association of Astacology (IAA), founded in Hintertal, Austria in 1972, is dedicated to the study, conservation, and wise utilization of freshwater crayfish. Any individual or firm interested in furthering the study of astacology is eligible for membership. Service to members include a quarterly newsletter, membership directory, bi-annual international symposia and publication of the journal Freshwater Crayfish.

Secretariat

The International Association of Astacology have a permanent secretariat. The Secretariat is managed by Jay Huner and the address is IAA Secretariat, P.O. Box 44 650, Univ. of Southwestern Louisiana, Lafayette, Louisiana 70504, USA; phone (318) 231-5239 / fax (318) 231-5395.

Officers:

•David Holdich, President, Dept. of Zool., Univ. of Nottingham, Nottingham NG7 2RD, England

•Jay Huner, President-Elect, Crawfish Center Univ., Southwestern Louisiana, Lafayette, Louisiana 70504, USA

•Jostein Skurdal, Sec./Treas., Eastern Norway Research Inst., P.O.Box 1066 Skurva, N-2601 Lillehammer, Norway

•James F. Payne, Past President, Dept. of Biology, Memphis State University, Memphis, Tennessee 38152, USA

From the editors

Have you remembered to send your booking form for the next IAA meeting, the IX International Association of Astacology Symposium. The booking form were enclosed in Crayfish News Vol 13 No 3. The Reading meeting in England is arranged on 5-10 April 1992. We will recommend all members to consider this opportunity to present their current results, meet colleagues and discuss crayfish in general. Deliver your booking form immediately and join us in Reading - remember its our 20th anniversary!

Jay Huner and Jostein Skurdal

IAA Reading meeting in April 1992

IX International Association of Astacology Symposium is arranged in Reading, England April 5 - 10, 1992. Bookings and payment of deposits for this symposium were due on October 1st 1991. Abstracts were also required by this date. If you are intending to attend then please let David Holdich know as soon as possible. The reason for us having to ask for such an early financial commitment is that the IAA will have to pay 20% of any monies lost by Reading University by people not taking up bookings. The organisers have to make a firm booking this month - if we book 150 and only get 130 then we have to pay a 20% on the 20 paces we could not fill! For those people wishing to arrive early or stay after the symposium accomodation can be provided by Reading University - please indicate if you require this on your booking form. Booking forms were enclosed in the last issue of Crayfish News.

For information contact: David M Hodich, Dept of Zoology, University of Nottingham, Nottingham NG7 2RD, England, Fax 0602 424270.

IAA travel assistance information

IAA receives inquiries from members about support for travel to our international symposia. We regret that we simply do not have sufficient funds to assist members in supporting their travel to the symposia. IAA has a savings account of approximately \$5,000 which is simply not enough to make a meaningful impact on the travel needs of our members. We would, most certainly, welcome donations for establishing a travel fund from interest generated by the moneys but would have to have at least \$100,000 to obtain enough interest

income to provide for a reasonable travel scholarship program. Remember, IAA's policy has been to keep dues as low as possible so that membership can be kept as large as possible.

IAA and American Society of Zoologist

IAA has been a co-sponsor of the ASZ meetings for some years now. However, IAA has not been especially active in this meeting usually held immediately after Christmas each year. A volunteer or volunteers is/are needed to be liaison with ASZ if a meaningful association is to be developed. The individual(s) would be responsible for making a call for contributed papers on crayfish biology and chairing the session(s) at the ASZ meeting. IAA can assist with mailings of announcements to members but will not be able to provide any significant funding for travel and meeting expenses. Any members wishing to be directly involved in the ASZ-IAA liaison, should contact: Jay Huner, Univ of Southwestern Louisiana, P. O. Box 44650, Lafayette, Louisiana 70504 USA, phone (318) 231-5239/fax (318) 231-5395.

Aquaculture Orlando '91

IAA is a "minor" sponsor of this aquaculture extravaganza scheduled for Orlando, Florida 21-25 May 1992. To obtain brochures and registration materials, contact: World Aquaculture Society, 143 J. M. Parker Coliseum, Louisiana State University, Baton Rouge, Louisiana 70803 USA.

Soft shell crayfish a soft sell

The Louisiana Soft-Shell Crawfish Association (LSSCA) (P.O. Box 80514, Baton Rouge, Louisiana 70898 USA) has developed a new promotional program with the assistance of the Louisiana Seafood Promotion & Marketing Board aimed at the state of Louisiana. Materials include an information brochure titled "Soft Shell Crawfish A Soft Sell" with a description of the product, its availability, and recipes for soft-shell crawfish tempura, fried soft-shell crawfish, and marinated and broiled soft-shell crawfish; a table tent inviting patrons to "Ask About the Soft-Shell Crawfish Kick"; and a pocket-sized information card for wait-staff titled "Soft Shell in Brief." Inquiries about soft-shell crawfish and promotional materials should be directed to LSSCA.

Crayfish aquaculture research in USA

The North Central Aquaculture Center (NCRAC) is developing a crayfish culture project entitled "Evaluation of Native Crayfish Species for Culture in the North Central Region. The objectives of the

project are: (1) Complete a comprehensive study of the status of the crayfish industry in the north central states, relative to its extent, culture operations in use, market characteristics, and problems which need to be addressed by research; (2) complete a report on indigenous crayfish species appropriate for culture in the North Central Region, to include species life histories, ranges of distribution, economic assessment of appropriate culture production systems, a bibliography of pertinent literature, and a summary of critical information gaps; and (3) conduct preliminary trials comparing the performance of two or more promising indigenous species in pond culture. For additional information, contact Cal McNabb or Ted Batterson, NCRAC, Michigan State University, 13 Natural Resources Building, East Lansing, Michigan 48824 USA.

Crayfish polyculture research in USA

Member Louis D'Abramo (Department of Wildlife & Fisheries, Mississippi State University, Mississippi State, Mississippi 39762 USA) writes about recent research involving *Procambarus clarkii* and freshwater prawn, *Macrobrachium rosenbergii*, culture in Mississippi, a warm temperate climate. The crop rotation system with crayfish-freshwater shrimp-crayfish research is progressing well and he is in the process of developing a manuscript on the work. Dr. D'Abramo's goal is to combine production of 2840 kg/ha of crayfish with 1365 kg/ha of freshwater prawns during a calendar year. During the past year, he started a project with controlled stocking of juvenile crayfish obtained from "brood" ponds. Three densities were used but survival was only 30-50%. This may have been the result of trying to stock very small juveniles that were stressed during the period of transfer from brood pond to production pond. This work will continue in the 1991-92 season.

Crayfish News translated into Russian

Member V. P. Fedotov (Chief Scientist of Astacology, Aquaservis of Association KIT impex, Leningrad, USSR) has translated Volume 13, No. 1 into Russian. This is certainly a most appreciated service and demonstrates considerable initiative and dedication. IAA is pleased that Dr. Fedotov has pursued this initiative.

***Procambarus* spp. in fingerling fish ponds**

Tim Nagel (Manager, London Fish Hatchery, 2470 Roberts Mill Road S.W., London, Ohio 43140 USA) has had to contend with red swamp crayfish, *Procambarus clarkii*, and white river crayfish,

Procambarus sp., in muskellunge, *Esox masquinongy*, and walleye, *Stizostedion vitreum*, fingerling ponds in the north central USA for some years. He reports that he has finally been able to control them by keeping his ponds dry in the winter. The cold weather apparently kills the adult and juvenile crayfish in burrows. In past years, water was allowed to stand in the ponds and the numbers of surviving crayfish was such that fingerling production was adversely affected.

***Procambarus clarkii* in Spain**

"Mud Crabs Menace Crops" is an article by Roy Wickman in the 5-7 July 1991 issue of The European. *Procambarus clarkii* is called a "crab" and is said to cause very serious problems to rice irrigation dikes. Rice production in parts of the Ebro has been reduced by one third. According to the article the species is reproducing at an alarming rate and spreading to several parts of Spain including Extremadura, Andalusia, Catalonia, and Valencia. The article does state, however, that the "crab" has become an important food source and has attracted many French tourists.

News from Pierre Laurent, France

Past president and honorary life member, Professor Laurent (Avonnes a Marin, F-74200 Thonon Cedex, France) writes about retirement and progress in re-establishment of *Astacus astacus* in France. Professor Laurent retired on March 1, 1991 and has been busy with crayfish in Morvan, Lorraine, and elsewhere. He has organized a small laboratory in his home and continues his activities from I.N.R.A.

The first stocking of *Astacus astacus* in Lorraine was made in November 1989 with adults from Finland. There was a lack of reproduction during the first winter but in the second year 89% of the females were in berry. Recovery of stocked males and females was 40% and 29%. The mean total length of males and females increased from 7.9 to 9.6 cm and 8.4 to 8.6 cm, respectively. A second pond was stocked in October 1990. No egg bearing females were captured. The mean total length of males and females increased from 8.4 to 8.7 cm and 8.4 to 8.6 cm, respectively. Two intersexual females were captured.

Crayfish course in Finland

The University of Kuopio, Kuopio, Finland sponsored a Scandinavian Short Course on Crayfish Aquaculture, 11-21 August 1991. Organizer was past-president Ossi Lindqvist (University of Kuopio,

P.O.B. 1627, SF-70211 Kuopio, Finland). Instructors included IAA members Hans Ackefors, Jostein Skurdal, Jay Huner, Robert Romaine, Walter Momot, Noel Morrissy, Kenneth Söderhäll, and Rolf Gydemo. Students came from Finland, Sweden, Norway, and Denmark. Emphasis was placed on Scandinavian species including the native *Astacus astacus* and the introduced *Pacifastacus leniusculus*. However, information about North American and Australian crayfishes was discussed at length. Dr. Momot was especially convincing in arguing that size limits were pointless in crayfish management as long as egg bearing females were protected. Dr. Morrissy provided very interesting information about management and culture of the various *Cherax* spp. from Australia. Dr. Romaine presented a PC model that simulates management of *Procambarus clarkii* in Southern USA crayfish ponds. The students visited several natural *Astacus astacus* populations in the vicinity of Kuopio including one where catches of 0.5-1.0 kg of crayfish per trap were common. This is especially interesting when one considers the fact that Kuopio is very near to the Arctic Circle near the limit of the species northern distribution.

EIFAC workshop on crayfish in Finland

Member Dr. Kai Westman (Finnish Game and Fisheries Research Institute, P.O. Box 202, SF-00151 Helsinki, Finland) was organizer of the EIFAC (FAO-UN) Workshop on Crayfish Management, 21-23 August 1991. The purpose of the workshop was to establish some meaningful guidelines for managing crayfish populations in Europe. International participants included Jay Huner and Robert Romaine, USA, Walter Momot, Canada, Noel Morrissy, Australia, David Holdich, England, and Hans Ackefors, Rolf Gydemo, and C. Lage, Sweden. A compendium of papers and summaries of management recommendations will be published by Dr. Westman with target date being January 1992. There is not enough space to properly address the comments made during the workshop; however, there are several main points that can be made. First, Dr. Westman conducted a thorough survey of management regulations for crayfish in Europe. This showed no rational management methodology. As a result, this showed a distinct need for standardizing seasons, size limits, translocations, etc. In fact, Dr. Westman questioned the need for size limits and even seasons. This survey should lead to rational management in the future through EIFAC's auspices. Second, Dr. Lage discussed problems with deve-

lopment of susceptibility of *Pacifastacus leniusculus* to the crayfish fungus plague and selective breeding of *Astacus astacus* for resistance to the plague. Third, it was clear that expansion of *Procambarus clarkii* in southern Europe and *Pacifastacus leniusculus* in Scandinavian is such that crayfish imports may soon be effected.

Procambarus clarkii in Egypt

Dr. Gamil N. Soliman (Chairman, Department of Zoology, Faculty of Science, University of Cairo, Giza, Egypt) has written to say that he has found *Procambarus clarkii* in waters of the Nile River in Egypt. This represents a further extension of this species' range and shows that it seems to be destined to become a member of the faunas of most warm temperate and tropical freshwater ecosystems.

Procambarus clarkii in Thailand?

Dr. Jirasak Tangtrongpiros (Faculty of Veterinary Science, Chulalongkorn University, Henri Dunant Rd., Pratumwan, Bangkok 10330, Thailand) sent the following comments in response to an inquiry about *P. clarkii* in Thailand. "...I am really interested in crawfish farming. I have heard that there are some private companies interested in rearing this species but I do not know the progress of this initiative in Thailand. *Macrobrachium rosenbergii* is the major species here. For crawfish, I think we have a possibility to do this if we have the seed and a good market...."

Crayfish exoskeleton calcification research

New Board Member Michele Wheatly (Department of Zoology, University of Florida, 223 Bartram Hall, Gainesville, Florida 32611 USA) sends the following information about her current work in the area of crayfish exoskeleton calcification. "...We are working on calcification of crayfish and find that, if you keep them in Ca-free artificial tap water (every thing else but Ca; this better for them physiologically than distilled water since they really need Na and Cl when they are soft) they do not harden their carapace. Of course you are correct-they do develop a paper shell which is not as soft as softshell...."

Crayfish oogenesis research

Member Milton Fingerman (Department of Biology, Tulane University, New Orleans, Louisiana 70118 USA) is one of the foremost crustacean endocrinologists in the world. His research team works with many species and many aspects of crus-

tean physiology. His team recently had a manuscript on neuroendocrine control of oogenesis in *Procambarus clarkii* accepted for publication. The authors and title are: Kulkarni, Gunderao K., Lisa Glade, and Milton Fingerman. Oogenesis and Effects of Neuroendo-crine Tissues on In Vitro Synthesis of Protein by the Ovary of the Red Swamp Crayfish, *Procambarus clarkii* (Girard). Eyestalk tissue generated an ovary-inhibiting hormone.

Orconectes rusticus in Lake Superior

Board member Walter Momot (Department of Biology, Lakehead University, Thunder Bay, Ontario P7B 5E1 Canada) has sent a manuscript being submitted to the Canadian Field Naturalist dealing with extension of the range of the rusty crayfish. He states that the introduced exotic crayfish has now extended its range to four additional localities in northwestern Ontario, including a first record from Lake Superior.

Yabbie farming in Australia

Member Martin Smallridge (South Australian Department of Fisheries, G.P.O. Box 1625, Adelaide, South Australia 5001, Australia) writes that he is responsible for a new aquaculture and extension program in South Australia. This program was developed because the yabbie farming industry is rapidly developing in South Australia with a continuing need for information transfer. The program will involve seminars, training courses, field days, and information pamphlets. Export markets have been developed for yabbies over the past 2 years and the extension service is expected to provide a coordinating service to the industry to enable it to take the best advantages of opportunities.

Crayfish culture in Canada?

The Aquaculture Association of Canada will hold its 9th annual meeting 31 May - 3 June 1992 in Vancouver, British Columbia at the University of British Columbia. One session entitled "New Invertebrates Species for Culture" will include a presentation on crayfish culture. For more information, contact: AAC, Box 1987, St. Andrews, New Brunswick E0G 2X0, Canada.

Crayfish cultured in Zambia

Member C. J. Grubb (P.O. Box 60287, Livingstone, Zambia) has cultured *Procambarus clarkii* in Zambia for over a decade. His farm was the subject of an article in *Zambian paper* in August of this

year. The article uses the term "clayfish" as the common name for this species. So, a new common name seems to have been coined for freshwater crayfish!

Inquiry about crayfish morphology

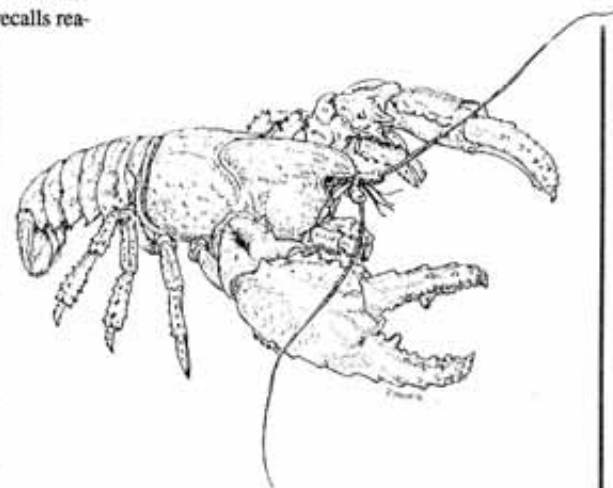
Member Jim Norrocky (162 Duchess Street, Vickery, Ohio 43464 USA) has been studying *Fallicambarus fodiens*, a primary burrower, for some years. He sent a copy of data with carapace length/weight ratios. There were distinct data breaks where carapace length increases from 24.4 to 26.4 mm, 28.3 to 36.3 mm with plateaus before and after each break. Maximum length was 41.1 mm. The weight of the larger crayfish appeared to increase relative to carapace length. Mr. Norrocky recalls reading about a distinct change in the abdomen at maturation but did not expect a continued change in the adults. He wonders if anyone is familiar with literature citations or has personal experience with this matter?

Information about Mexican crayfish

Members Ma. Luisa Fanjul Moles and Theresa Bosques-Tistler (Facultad de Ciencias, Departamento de Biología, Universidad Nacional Autónoma, Mexico City, Mexico) have sent information about the crayfish species present in Mexico and their distributions. The entire listing is too long for this newsletter but will be published in *Freshwater Crayfish* 8. The two scientists are physiologists and several of their papers are listed in the Recent Literature section below. Some information from their letter follows. The Mexican crayfishes belong to the family Cambaridae and the genera *Cambarellus* and *Procambarus* with 37 species being present. The largest variety of species is associated with the states of Puebla and Veracruz. They secure their laboratory specimen of *Procambarus clarkii* once a year from irrigation canals in the state of Chihuahua in northwestern Mexico. Their work now involves the study of crustacean developmental biology and centers on *P. clarkii*. This species is not eaten, to their knowledge, in Mexico but *Cambarellus montezumae* is a popular food in central Mexico. In Mexico, the common name for crayfish is "ACOCIL." It has Aztec origins: A from ATL - water; cocil from cocili - implies the idea of small shrimp; I from IN - suffix - acocili. Acocil is the Spanish word derived from this Aztec word and it is presently used.

Crayfish videos available

Two 10 minute videos, *Crawfish Anatomy and Physiology* and *Crawfish Harvesting*, are available from the Crawfish Research Center, P.O. Box 44650, University of Southwestern Louisiana, Lafayette, Louisiana 70504 USA. These feature *Procambarus clarkii* and *Procambarus zonangulus*, the two important Louisiana commercial species. These videos were prepared for high school level science and vocational agricultural classes. The cost is \$10 each, including postage and handling in the USA, and \$12 each elsewhere.



Astacopsis gouldii drawn by Premek Hamr

Tasmanian crayfish research

Member Premek Hamr (Inland Fisheries Commission, 127 Davey St., Hobart, Tasmania 7000, Australia) has devoted his PhD studies on the Tasmanian crayfishes. See the Recent Publications section for the references that Dr. Hamr has sent. The most glamorous species is *Astacopsis gouldii*. Minimum legal size is about 27.8 cm total length. The daily bag limit is 12 per person but it is difficult to catch a limit with average catch being just over 7 per day. Annual catch is estimated at 10-15,000 with the fishery being limited to the north and north-west of the large island state.

Dr. Hamr notes that he is interested in securing a post-doctoral position in North America. He is a native of Canada. He may be contacted at the address given above.

Expansion of exotic crayfish in France

Member Jacques Arrignon (24, rue de la 8e Division, F-60200 Compiègne, France) has compiled a listing of the French Departments where various species of crayfish now occur. Of interest is the expansion of the ranges of *Pacifastacus leniusculus* and *Procambarus clarkii* because they are the most recently introduced species in France. The report entitled "Enquete Nationale Sur La Situation Des Ecrevisses en France" is dated 30 September 1991. A brief summary of the number of Departments where various species are reported follows.

<i>Austropotamobius pallipes</i>	(native)	- 71
<i>Astacus astacus</i>	(native)	- 22
<i>Astacus leptodactylus</i>	(introduced)	- 28
<i>Orconectes limosus</i>	(introduced)	- 84
<i>Procambarus clarkii</i>	(introduced)	- 19
<i>Pacifastacus leniusculus</i>	(introduced)	- 22

Crayfish culture research in Spain

Jesus Gonzalez Garcia (Dept. of Animal Production, University of Leon, 24071 Leon, Spain) has sent a list of 24 references for crayfish papers published or about to be published by the research group in his department. These date from 1984. Many of the references have already appeared in this newsletter; however, the most recent ones on the list are included in the Recent publications section below. The work in Leon centers on the native *Austropotamobius pallipes* and the introduced *Pacifastacus leniusculus*.

Crayfish harvesting by trawl in Louisiana

The Crawfish Research Center (P.O. Box 44650, Lafayette, Louisiana 70504 USA) has developed a "Crawfish Skimmer" net to harvest crayfish, *Procambarus* spp., in debris free Louisiana crayfish ponds. This beam trawl system utilizes two nets roughly two meters wide and 0.3 m deep mounted on either side of a standard hydraulic crayfish harvest boat. Polyvinyl net webbing reduces accumulation of small crayfish. Use of bait lines dramatically increases catch and reduces the amount of soft crayfish by-catch. Developer of the net is Mr. Gregory Faulkner, Fisheries Gear Specialist for the Crawfish Research Center. The project has been funded by the Southern Regional Aquaculture Center.

Crayfish trade: Sweden and China

Co-editor Jay Huner visited Sweden in August 1991 and found that frozen, whole cooked Louisiana *Procambarus clarkii* and *Procambarus zonagulus*

sold well. Inventory from 1990 was sold quickly. New Louisiana product received excellent ratings in the annual evaluation by the news media. Spanish *Procambarus clarkii* was acceptable. California *Pacifastacus leniusculus* received very poor ratings. Little, if any, *Orconectes* spp. was imported from the northern USA in 1991. Domestic production of the native *Astacus astacus* and the introduced *Pacifastacus leniusculus* was reduced as a consequence of a very cold spring and early summer. However, *Pacifastacus leniusculus* production continues to expand compared to past years and the species has come to represent the third most valuable fisheries in the country ranking behind only salmon and herring.

Low inventories of crayfish meat in Louisiana were bolstered in early autumn by imports of frozen crayfish meat (*Procambarus clarkii*) from the People's Republic of China. Some 90-100 tonnes of meat have been or will be received by late autumn. Most sales are to restaurants at prices around \$14.00 per kg. This compares to about 30 tonnes imported the previous year. The long term effects of these imports on the domestic Louisiana market and world markets remain to be seen. Producers and importers of Chinese product can certainly expect the closest of scrutiny with respect to microbiological standards.

Yabby book challenge production myths

Ms. Jo Buckee has completed an honors thesis on yabby, *Cherax albidus*, culture. A book review in *Austasia Aquaculture* 5(11)1991 states indicates that the 224 thesis challenges established dogma on yabby culture. It examines environmental conditions affecting yabby production in farm ponds. The research was supervised by Mulataga Aquaculture, a company whose weekly production of farmed yabbies exceeds a ton from across inland Western Australia. There will be a limited number of copies of the thesis. Advance orders are being received for a publication date of October/November 1991. Contact: Mulataga Aquaculture, P.O. Box 343, Gosnells, Western Australia 6110 Australia

Publications of Interest to Astacologists

Please note: IAA is not able to provide copies of these publications to members. Please use traditional Library services.

Affre, P. 1991. Les ecrevisses indigenes. Le Chasseur Francais Juin 1991:52-56.

Affre, P. 1991. Un vrai panier d'ecrevisses. Le Chasseur Francais Juillet 1991:71-74.

Affre, P. 1991. Les ecrevisses exotiques acclimatées. La Pêche et les Poissons 556:42-47.

Almaga, C. 1991. L'ecrevisse a pied blancs, *Astacus pallipes* Lereboullet 1858 au Portugal. L'Astaciculteur de France 28:11-16.

Buckee, J. 1991. Environmental conditions affecting yabby production in farm dams. Honours Thesis, School of Biological and Environmental Sciences, Murdoch University, South St., Murdoch, Western Australia 6150, Australia.

Carral, J. M. 1990. Incubacion artificial en el cangrejo de rio *Pacifastacus leniusculus* Dana y desarrollo de los huevos de *Austropotamobius pallipes* Lereboullet. Tesis Doctoral en microficha no. 53, Ed. Universidad de Leon, Spain 229pp.

Carral, J. M., J. D. Celada, J. Gonzalez, & V. R. Gaudio. 1991. Mating and spawning of freshwater crayfish (*Austropotamobius pallipes* Lereboullet) under laboratory conditions. Submitted to J. Expt. Biol.

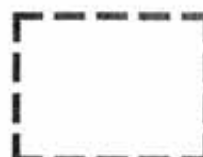
Carral, J. M., J. D. Celada, J. Gonzalez, V. R. Gaudio, R. Fernandez, & C. Lopez-Baïsson. 1991. Artificial incubation of crayfish eggs (*Pacifastacus leniusculus* Dana) from early stages of embryonic development. Submitted to *Aquaculture*.

Celada, J. D., J. M. Carral, & J. Gonzalez. 1991. A study on the identification and chronology of the embryonic stages of the freshwater crayfish *Austropotamobius pallipes* Lereboullet. *Crustaceana* (In Press).

Celada, J. D., V. R. Gaudio, R. Fernandez, J. M. Carral, J. Gonzalez, C. Temino, & J. R. Gonzalez. 1990. El ocase del cangrejo de rio. *Quercus* 49:19-22.

Celada, J. D., J. M. Carral, V. Gaudio, J. Gonzalez, C. Lopez-Baïsson, & R. Fernandez. 1991. Survival and growth of juvenile freshwater crayfish (*Pacifastacus leniusculus* Dana) fed two raw diets and two commercial compound feeds. *J. World Aquaculture Soc.* (In Press).

Chambers, P.A., J.M. Hanson & E.E. Prepas. 1991.



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P.O.Box 44 650
Univ. of Southwestern Louisiana
Lafayette
Louisiana 70 504
USA

Membership application 1990 - 1992

Name:
Address:
Field of interest & species:
Fees: Regular US\$25 Student US\$12.50 Business US\$50
Orders
IAA Label pins US\$4
8th IAA symposia poster (signed) US\$15

No
No

Must be paid in US\$ to secretariat. Check in USA or international money order or draft drawn on an American bank.

The effect of aquatic plant chemistry and morphology on feeding selectivity by the crayfish *Orconectes virilis*. *Freshw Biol* 25(2): 339-338.

Davies, P. 1991. The fishery for freshwater crayfish in Tasmania. *Inland Fisheries Commission of Tasmania Newsletter* 20(1):5.

Ding, Q. & Tobe, S.S. 1991. Production of farnesoic acid and methyl farnesoate by mandibular organs of the crayfish, *Procambarus clarkii*. *Insect Biochem* 21 (3): 285-292.

Fanjul-Moles, M. L., E. Moreno-Saenz, N. Villalobos-Hiriart, & B. Fuentes-Pardo. 1987. ERG circadian rhythm in the course of ontogeny in crayfish. *Comp. Biochem. Physiol.* 88A:213-219.

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1991 World Aquaculture Society meeting

The following papers were presented at the 22nd Annual Conference & Exposition of the World Aquaculture Society in San Juan, Puerto Rico USA, June 16-20, 1991. Inquiries about copies of the abstracts should be directed to: Home Office, World Aquaculture Society, J. M. Parker Agricultural Center, Louisiana State University, Baton Rouge, Louisiana 70803 USA.

Austin, C. M. Effect of temperature and salinity on the survival and growth of juvenile red claw (*Cherax quadricarinatus*).

Brown, P. B., J. E. Wetzell II, & A. Spacie. Nutritionally important, naturally occurring food for larval crayfish (*Procambarus clarkii*).

Malone, R. F., and J. E. Robin, and D. E. Coffin. Low density biomediated filtration of a commercial scale recirculating soft crawfish production facility.

Medley, P. B., L. U. Hatch, R. G. Nelson, & D. B. Rouse. Economic feasibility and risk analysis of pond produced Australian red claw crayfish (*Cherax quadricarinatus*) in the southeastern United States.

Medley, P. B., D. B. Rouse, & Y. J. Brady. Biological interactions of the red swamp crayfish (*Procambarus clarkii*) and the Australian red claw (*Cherax quadricarinatus*) in communal culture ponds.

Pfeiffer, T. J., G. K. Vidrine, & T. B. Lawson. Engineering considerations for using paddlewheel aerators in recirculating crawfish ponds.

Robin, J. E., S. Chen, & R. F. Malone. Operational and management strategies for a commercial scale automated soft crawfish production facility.

Rondelle, R. E., S. Chen, & R. F. Malone. Vertical distribution in an automated recirculating softshell crawfish separator.

Rouse, D. B. & P. B. Medley. Experimental pond production of the Australian red claw (*Cherax quadricarinatus*) in the southeastern United States.

Silva, J., E. Marroquin, Y. M. Lai, & L. R. D'Abramo. Yield and textural properties of pond raised crayfish *Procambarus clarkii* during harvest-season.

Whaley, M. W., A. G. Eversole, & J. M. Whetstone. Supplemental feeding of crawfish.

New IAA members

The interest for crayfish research is growing worldwide and the number of IAA members as well. The efforts to recruit members should continue in order to create the basis for a better organization. A big thank you to those recruiting new members and a sincere welcome to our new members:

Andersen, Jesper. Halgreensgade 1, 1tv, DK-2300 Copenhagen S, Denmark

Burkitt Bjorg Knutsun, Apartment M24 Wenner-Gren Center, Seavagen 166, S-11346 Stockholm, Sweden

Cervantes, Oscar Catanon. Trabajo y Prevision Social #106, Col. Federal, C. P. L5700 Mexico D. F., Mexico

DeWet, C. J., P.O. Box 224, Port Elizabeth 6000, Republic of South Africa

Fedotov, V.P., Chief Scientist Astacology, Aquaservis of Association KIT impex, Leningrad, USSR

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Lunder, Kato, County Environmental Administration, P.O. Box 6888 St. Olavs Plass, N-0130 Oslo 1, Norway

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Rognerud, Sigurd, Norwegian Institute of Water Research, Rute 866, N-2311 Ottestad, Norway

Swedish Federation of Fishing Water Owners, S-105 33 Stockholm, Sweden

Wackenhuth, Mike, 5317 S. Columbia Place, Tulsa, Oklahoma 74105 USA

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Bosques Tistler, Theresa - note, Dr. Bosques Tistler's name is incorrectly listed as Tistler, Theresa Bosques

Dalla Via, Josef - note, Dr. Dalla Via's name is incorrectly listed in the Directory as Via, Josef Dalla

Drinkwaard, Drs. A. C. (Bram), SMS Julianastraat 18, P.O. Box 135, N1-1790 AC Den Burg-Texel, The Netherlands

Fanjul Moles, Ma. Luis - note, Dr. Fanjul Moles' name is incorrectly listed in the Directory as Moles, Ma. Luis Fanjul

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Forbes, Alex, 5310 Holly View Drive, Houston, Texas 77091 USA

Skurdal, Jostein, Eastern Norway Research Institute, P.O. Box 1066 Skurva, N-2601 Lillehammer, Norway

New institutional members

Fisheries District of Turku, Hameenkatu 28, SF-20700 Turku, Finland. Species Studied - *Astacus astacus* and *Pacifastacus leniusculus*.

Freshwater Crayfish

Freshwater Crayfish is an important source of information for astacologists. Unfortunately some of the volumes are not available anymore. However we are doing some efforts to reprint those which are out of print. Below is a list of available volumes and a description on how to obtain them:

1. **Freshwater crayfish I** (1973) - A limited number of fresh copies have been found in a storage room and will be made available to the public. If you want a copy, write Ms Gunilla Lindquist, Ecology Building, Univ. of Lund, S - 223 62 Lund, Sweden. Cost is US\$ 20 plus US\$ 5 surface postage.

2. **Freshwater crayfish IV** (1979) - Prof. Pierre J. Laurent, Avonnex a marin, F-74 200 Thonons les Bains Cedex, France. Payment is 63 Swiss francs (surface mail expenses included). Make payment to the International Association of Astacology's bank account, Credit Lyonnais, 1 Place Bel Air, Geneve,