Title	Performance of Artificially Cultured Polychaete Worms as Alternative Sustainable Marine Fishing Bait and Mariculture Fish Feed in Kenya
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Purpose	To determine the suitability of locally cultured polychaetes as alternative fish feed and bait in Kenya
Project Summary	Wild harvesting of both polychaete bait (*Marphysa* sp) and fish, continues to negatively impact tropical biota and livelihoods. Artificial culture of polychaetes can provide an alternative that, reduces such pressures, and improves livelihoods, for fishers and mariculture. This project proposes to identify cost effective techniques of culturing *Marphysa* sp to provide quality fish bait and marine fish feed. The project is envisaged to occur over three phase: Phase I- polychaete culture protocol development, Phase II: Testing performance of cultured organism and Phase III: Dissemination. In phase I; culture regimes used in culturing related polychaete taxa elsewhere will be tested on local varieties (*Marphysa* sp). Cultured polychaete cohort nutrient content, yield and life-table data will be obtained. Cultured polychaetes will be

	used in Phase II performance trials where two thesis; performance in bait fishing and as mariculture fish feed will be undertaken. Results obtained will be shared with stakeholders in a consultative workshop in Phase III. This workshop will examine SWOT of cultured bait with the aim of identifying best practices that deliver superior fish bait and fish meal, suitable for adoption among users, in Kenya, and elsewhere. These information will be developed into a pamphlet for onward transmission to stakeholders. Key Words: *Marphysa*, culture protocol, bait, fish feed, performance
Country and Location	Kenya: Kenyan coastline; Malindi, Mombasa, Kwale county; Nakuru county Egerton University, Njoro; Kirinyga county, Sagana.
Participating institutions	Department of Biological Sciences, University of Nairobi, Nairobi Kenya Aquaculture Research Division, Kenya Marine and Fisheries Research Institute, Sagana, Kenya. Mariculture Department, Kwetu Training Centre, Mtwapa, Kenya
Start date	1st July, 2015
End date	30th July, 2017
Budget	USD 59,609

Charles Maina Kihia (PhD)

Dr. Kihia Charles Maina is an ecologist and environmental scientist based at the Department of Biological Sciences of Egerton University. His role at the department include training and mentoring undergraduate and post-graduate students on diverse aspects of tropical ecology. As a senior lecturer at the department, he is also involved in research with specialization on sustainable utilization of tropical natural resources. Dr. Kihia holds a BSc. in Zoology, a MSc. in Ecology from Moi University (Kenya) and PhD in Environmental Sciences from Egerton University (Kenya). Dr. Kihia pursued his master degree under the Moi University scholarship, where his research focused on the biology and ecology of the exotic cypress aphid pest that ravaged Kenyan forests during that period. Having successfully completed his MSc. studies, Dr. Kihia was employed as an Assistant Lecturer; Department of Zoology at Egerton University. His stint in teaching enabled him to obtain a DAAD PhD scholarship; that facilitated his research on the impact of human disturbance on litter dynamics in mangrove forests. Dr. Kihia's interest in sustainability of resource utilization saw him win a DAAD post-doc fellowship, to evaluate the impact of human disturbance on nutrient dynamics in mangrove forests. Dr. Kihia is currently a collaborator in two NACOSTI funded research projects dealing with bait fisheries and bioprospecting for medicinal extract from mangrove forest endophytes, respectively. He is also a collaborator on a another bioprospecting study targeting medicinal properties of endophytes from high altitude forest such as Mt. Kenya and Aberdares that is funded by Jomo Kenyatta University. Dr. Kihia has published a number of articles on human dimension in mangrove forest, fishery and invertebrate exploitation. In furthering research, Dr. Kihia's current interest in polychaete culture is geared towards reducing pressure on wild populations, while providing tropical communities with alternative livelihood options, in the face of the multitude of challenges that confront these resource poor communities.

Selected Publication

Kihia, C.M., Muthumbi, A., Okondo, J., Nthiga, A., Njuguna, V.M. (2015). Influence of human disturbance on shell utilization by gastropods and hermit crabs along at tropical mangrove fringed creek, Mida Kenya. Wetlands Ecology and Management. 23(2), Doi 10.1007/s11273-015-9429.

Kihia, C.M.., Muthumbi, A., Okondo, J., Nthiga, A., Njuguna, V.M. (2015). Mangrove hermit crab utilization in artisanal bait fishery: Narratives on bait collection, processing and use by bait fishers at creek, Mida, Kenya. SANCOR Newsletter, 2015(207): 21-22.

Kihia, C.M., Hendrick, Y., Muthumbi, A., Okondo, J., Nthiga, A., Njuguna, V. (2015). Morphometric characterization of fish landed by artisanal bait fishers at the Mida creek, Kenya. International Journal of Fisheries and Aquaculture, 6(2); 15-24; Doi 10.5897/IJFA14.0451.

Kihia, C.M., Saint-Paul, U., Mathooko, J.M., Ruwa, R.K., Shivoga, W.A. (2015). Leaf litter processing in Kenyan mangrove forest impacted by human physical disturbance. Journal of Environment, natural Resource Management and Society, Vol 2(2); 59-73.

Kihia, C.M. (2014). Impact of human physical disturbance on mangrove forest structure at the Gazi bay, Kenya. Egerton Journal of Science and Technology 14: 31.48.

Kihia, C.M., Mathooko, J.M., Ruwa, R.K., Shivoga, W.A. (2012). Influence of human physical disturbance on litter standing crop biomass in a tropical mangrove forest. Journal of Environment, Natural Resource Management and Society 1:1-12.

Kihia, C.M., Mathooko, J.M., Ruwa, R.K., Shivoga, W.A. (2012). Leaf herbivore preference in a tropical mangrove forest impacted by human physical disturbance International Journal of Ecology and Development Vol 22(2) 52-62.

Kihia, C.M., Mathooko, J.M., Ruwa, R.K., Shivoga, W.A. (2011). Influence of human disturbance on leaf herbivory at Gazi bay mangrove forest, Kenya. African Journal of Aquatic Science 36(3).

Kihia, C.M., Mathooko, J.M., Ruwa, R.K., Shivoga, W.A. (2010). Mangrove litter biomass input in a forest impacted by human disturbance. Ecotropica 16: 113-123.

Selected Funded Research Projects

- **2014-todate**: Prospecting for bio-active potential of endophytes associated with medicinal forest trees in Kenya and their efficacy against pathogenic fungal pathogens. **2.9 Million Ksh. Partner**
- 2014-todate: Bioactive potential of mangrove endophyte extracts and their efficacy against common fish pathogens. 1.8 Million Ksh. **Partner**
- **2012:** Ecological impacts of bait fisheries among communities living adjacent to coastal wetlands 1.5 Million Ksh. **Partner**