IDENTIFICATION OF A NEW POTENT SPERM IMMOBILIZING AGENT FROM EDIBLE MEDICINAL PLANT

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Objective: The goal of our study was to investigate several new potent sperm immobilizing agents as possible male oral contraceptive from edible medicinal plants. Design: Present investigation was carried out by a random screening of 9 medicinal plants [e.g. : *Allium sativum* linn. (family- Lilliacea); *Zingiber officinale* Linn (family- Zigiberaceae); *Curcuma longa* Linn (family- Zigiberaceae); *Allium cepa* Linn (family- Lilliacea); *Curcuma amada* Linn (Family- Zigiberaceae); *Eugenia caryophyllata* Linn. (family- Myrtaceae); *Elattaria cardamomum* Linn. (family- Zigiberaceae); *Cinnamomum tamala* Linn (family-Lauraceae);and *Cinnamomum zeylanicum* Linn( family-Lauraceae). Materials and Methods: Selection of these highly active plants was done by testing their immobilization effect on ram cauda epididymal sperm at a particular concentration. The aqueous extract of only two plants (*E. caryophyllata* and *A. sativum*) showed most interesting results. These 2 were used for studies on human ejaculated sperm and a comparative study of EC 50 of both the extracts recognized *A. sativum* as more potent plant. Partial purification and characterization of *A. sativum* aqueous extract were performed to determine the contents of the active fraction responsible for immobilization activity. The functional characteristics of ejaculated spermatozoa incubated with above plant extract, was measured by the hypo-osmotic swelling test (HOST), viability stain, and by measuring the 5’nuclotidase and acrosin activity. Results: The active fraction contains mainly plant glycoside of 1512 molecular weight. The glycone part contains a linear heptasaccharide with six ß-linked galactose and one inositol molecules. Sperm viability decreased by >50% in treated sperm (30.00±3.00 vs. 67.00±6.25) compared to control, tail swelling by HOST decreased by >70% in treated (15.00±4.00 vs. 68.00±3.00) compared to control. There was a significant reduction in the activity of membrane bound marker enzyme 5’nucleotidase (6.52±1.37 vs. 2.25±1.09 µg-Pi released/hour/10^8 cells in control and treated, respectively) and acrosomal acrosin (from 331.25±76.60 vs. 70.19±2.38 mIU/min/10^8 cells in control and treated, respectively). Conclusion: Crude as well as partially purified extract of *A. sativum* appear to exert its
effect by destabilizing the sperm membrane architecture, thereby initiating the release of the membrane bound molecules essential for maintenance of sperm motility. These agents may, in future, be used as an additive in vaginal contraceptive preparations. 
Support: None 

Author Disclosure Block: K. Chakrabarti, None; A.K. Sen, None; A. Agarwal, None; A.K. Bhattacharyya, None.

Category (Complete): Contraception (CSIG)
Keyword (Complete): sperm ; contraception ; herbs
Additional (Complete):
  Presenting Author Fellow : Yes
  In-Training Award: : True
  ACCME Disclosure: : I will not be discussing non-FDA approved products
  I Agree : True

Status: Complete