

Dr. B. I. Sundararaj

Partial List of Research Publications

1: Chronobiologia. 1986 Jan-Mar;13(1):1-11.

Role of pineal in the regulation of some aspects of circadian rhythmicity in the catfish, Heteropneustes fossilis (Bloch).

Garg SK, Sundararaj BI.

The findings reported here indicate that the pineal organ in catfish is involved in the regulation of locomotor activity rhythms and in some aspects of osmoregulation. Under LD 12:12 regimen, catfish is nocturnally active, with the maximum activity just before dawn. However, under conditions of continuous darkness (DD), the locomotor rhythm became free-running. Pinealectomy abolished the activity rhythm under DD and resulted in arrhythmicity. Circadian rhythms in plasma cortisol, osmolality and electrolytes (Na⁺ and K⁺) were also observed. Pinealectomy, though, increased the amplitudes of the rhythm; however the differences were not statistically significant. Removal of pineal significantly increased the mesor values of plasma osmolality and electrolytes, but there were no significant differences in the mesor values of plasma cortisol.

PMID: 3720425 [PubMed - indexed for MEDLINE]

2: Gen Comp Endocrinol. 1985 Jan;57(1):53-63.

Gonadotrophin-induced oocyte maturation in the catfish, *Heteropneustes fossilis* (Bloch), requires steroidogenesis in both interrenal and ovary.

Goswami SV, Lamba VJ, Sundararaj BI.

Intact or hypophysectomized catfish, *Heteropneustes fossilis*, were administered a single injection of ovulating doses of ovine luteinizing hormone (LH: 200 micrograms/100 g body wt) or partially-purified salmon gonadotrophin (SG-G100: 100 micrograms/100 g body wt). Identical groups of catfish were injected with a suboptimal dose of LH (20 micrograms/100 g body wt) or with porcine adrenocorticotrophin (ACTH: 0.25 IU/100 g body wt). At short intervals after hormone administration, plasma and/or ovarian tissue were analyzed for cortisol (F), testosterone (T), and estradiol-17 beta (E2) by radioimmunoassay. Following administration of ovulatory doses of gonadotrophins, plasma levels of the three steroids increased in a sequential manner; high levels were recorded between 15 and 45 min for F and between 45 and 90 min for T and E2. In gonadotrophin-injected catfish, the ovarian content of T and E2 increased during the first 45 min and then declined up to 90 min even as their titers in the plasma were still

increasing. When ovarian pieces containing yolky oocytes were incubated in vitro with LH (50 micrograms/ml), levels of T and E2 in the culture medium increased in a sequential manner similar to that observed following in vivo administration of gonadotrophin. No significant change was observed in the levels of any of the three steroids in catfish injected with a suboptimal dose of LH. In catfish treated with ACTH, plasma F levels increased 40-fold, whereas T and E2 levels did not change; ACTH administration had no effect on oocyte maturation. These results suggest that gonadotrophin, at doses sufficient to evoke oocyte maturation, acts at two loci, the interrenal and the ovary. The results also suggest that the failure of ACTH to induce oocyte maturation is due to its inability to act on the ovary.

PMID: 2982697 [PubMed - indexed for MEDLINE]

3: J Exp Zool. 1984 Mar;229(3):375-81.

Effects of hypophysectomy on some osmoregulatory parameters of the catfish, *Heteropneustes fossilis* (Bloch).

Parwez I, Goswami SV, **Sundararaj BI.**

The catfish, *H. fossilis*, survives for long periods after hypophysectomy, although with impaired osmoregulatory mechanisms. Plasma osmolarity and cortisol levels decline significantly within 2 hr after hypophysectomy and attain the lowest values by about 27 hr. Hypophysectomy also results in a marked decrease in urine flow rate principally due to reduced glomerular filtration. The reduction in the ability of the kidney of hypophysectomized catfish to eliminate water results in hyperhydration of blood and muscle. Urine osmolarity and sodium concentration increase due to reduced tubular reabsorption of sodium. There is, however, no net change in the total urinary sodium loss. The catfish survives in fresh water after hypophysectomy presumably because its tissues can tolerate significant dilution of the body fluids.

PMID: 6707596 [PubMed - indexed for MEDLINE]

4: Gen Comp Endocrinol. 1983 May;50(2):205-25.

Circannual and circadian variations in plasma levels of steroids (cortisol, estradiol-17 beta, estrone, and testosterone) correlated with the annual gonadal cycle in the catfish, *Heteropneustes fossilis* (Bloch).

Lamba VJ, Goswami SV, **Sundararaj BI.**

Circannual and circadian variations in plasma levels of steroids were estimated by radioimmunoassay in the female and male catfish, *Heteropneustes fossilis*, over two consecutive annual reproductive cycles. In the female catfish, testosterone (T), estradiol-17 beta (E2), and estrone (E1) were detectable in the plasma only during the

reproductively active (preparatory through spawning) period and their levels increased during vitellogenesis. In the fully gravid catfish, when vitellogenesis was nearly complete, levels of E2 declined but those of T continued to increase suggesting a product-precursor relationship between the two steroids. Plasma cortisol (F) was detectable throughout the year and exhibited three peaks coinciding with summer, monsoon, and winter; the first and second peaks coincided with vitellogenesis and spawning, respectively. In the male catfish, changes in plasma T and F levels closely paralleled the seasonal recrudescence and activity of testes and seminal vesicles. After spawning, gonads regressed and levels of sex steroids declined sharply. In the absence of natural spawning due to scanty monsoon rains, as during the second year of this study, gonadal regression was delayed and the sex steroids persisted in the plasma well beyond the normal spawning season. In addition, the first two peaks of F levels merged to form a plateau extending from the preparatory period until the late spawning period. The three sex steroids (T, E2, and E1) exhibited identical circadian rhythms; a major peak occurred at the onset of the dark phase (20:00 hr) and a minor peak was generally observed 4 hr after the onset of the light phase (12:00 hr). The amplitude of rhythms was greatest during the prespawning and the spawning periods. Cortisol peak levels generally alternated with those of sex steroids. Steroid rhythms show rather precise correlations with environmental factors such as photoperiod, temperature, and rainfall as well as with seasonal reproductive activity in both sexes of catfish.

PMID: 6862170 [PubMed - indexed for MEDLINE]

5: Gen Comp Endocrinol. 1982 Nov;48(3):390-7.

Role of testosterone, estradiol-17 beta, and cortisol during vitellogenin synthesis in the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Goswami SV, Lamba VJ.

PMID: 7152240 [PubMed - indexed for MEDLINE]

6: Gen Comp Endocrinol. 1982 Jun;47(2):170-81.

Radioimmunoassay for plasma cortisol, testosterone, estradiol-17 beta, and estrone in the catfish *Heteropneustes fossilis* (Bloch): development and validation.

Lamba VJ, Goswami SV, **Sundararaj BI**.

PMID: 7095414 [PubMed - indexed for MEDLINE]

7: J Nutr. 1982 Jun;112(6):1085-97.

Circadian meal timing in relation to lighting schedule optimizes catfish body weight gain.

Sundararaj BI, Nath P, Halberg F.

Two groups of 4- to 5-month-old catfish, *Heteropneustes fossilis*, were studied 2 years apart, in each case after standardization in light for 12 hours, alternating with darkness for 12 hours. The two studies involved 5 groups of 10 catfish each and 10 groups of 17 catfish each, respectively. In each study some fish were allowed access to food only during certain times in the circadian cycle: early dark, late dark, early light and late light for 45 or 50 days. On the average, in both studies, the catfish on restricted feeding schedules gained in body weight but more so when fed at certain times in the circadian cycle as compared to others. A circadian rhythm in weight response was demonstrated by a zero-amplitude test associated with the fit of a 24-hour cosine curve to the data (P less than 0.03). The acrophase (time of high values) for body weight gain occurred consistently either near the middle or in the second half of the daily dark span. That is, body weight gain in the presumably dark-active catfish seems to be maximal when food is made available in the middle or later part of the daily dark span. In catfish, as in human beings and mice, the timing of food intake can serve to optimize the utilization of ingested calories, by mechanisms yet to be elucidated.

PMID: 7086538 [PubMed - indexed for MEDLINE]

8: Gen Comp Endocrinol. 1982 Jan;46(1):93-8.

Synthesis of vitellogenin and its uptake by the ovary in the catfish, *Heteropneustes fossilis* (Bloch) in response to carp gonadotropin and its subunits.

Sundararaj BI, Nath P, Burzawa-Gerard E.

PMID: 7060940 [PubMed - indexed for MEDLINE]

9: Gen Comp Endocrinol. 1981 Feb;43(2):201-10.

Steroid-induced synthesis of vitellogenin in the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Nath P.

PMID: 7227802 [PubMed - indexed for MEDLINE]

10: Gen Comp Endocrinol. 1981 Feb;43(2):184-90.

Isolation and identification of female-specific serum lipophosphoprotein (vitellogenin) in the catfish, *Heteropneustes fossilis* (Bloch).

Nath P, **Sundararaj BI**.

PMID: 7227801 [PubMed - indexed for MEDLINE]

11: Gen Comp Endocrinol. 1981 Feb;43(2):191-200.

Induction of vitellogenesis in the hypophysectomized catfish, *Heteropneustes fossilis* (Bloch): effects of piscine and mammalian hormones.

Nath P, **Sundararaj BI**.

PMID: 6262188 [PubMed - indexed for MEDLINE]

12: J Steroid Biochem. 1979 Jul;11(1C):701-7.

Some aspects of oocyte maturation in catfish.

Sundararaj BI, Goswami SV, Lamba V.

PMID: 491639 [PubMed - indexed for MEDLINE]

13: Gen Comp Endocrinol. 1978 Feb;34(2):149-57.

Effects of gonadotropins and adenocorticotropin on plasmatic steroids of the catfish, *Heteropneustes fossilis* (Bloch).

Truscott B, Idler DR, **Sundararaj BI**, Goswami SV.

PMID: 204538 [PubMed - indexed for MEDLINE]

14: Gen Comp Endocrinol. 1977 May;32(1):17-28.

Hormonal Regulation of in vivo and in vitro oocyte maturation in the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Goswami SV.

PMID: 863220 [PubMed - indexed for MEDLINE]

15: Gen Comp Endocrinol. 1976 Dec;30(4):472-6.

Effects of carp gonadotropin on ovarian maintenance, maturation, and ovulation in hypophysectomized catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Nayyar SK.

PMID: 1010306 [PubMed - indexed for MEDLINE]

16: J Exp Zool. 1976 Aug;197(2):247-63.

Response of the ovary in the catfish, *Heteropneustes fossilis* (Bloch), to various combinations of photoperiod and temperature.

Vasal S, **Sundararaj BI**.

Responses of the ovary of the catfish, *Heteropneustes fossilis*, to various regimes of photoperiod and temperature, were studied during the different periods of the annual ovarian cycle. During the preparatory and post-spawning periods moderate temperatures of 25 degrees C and above, regardless of photoperiod, were more favorable for the formation of yolky (stage III) oocytes than cooler temperatures (below 23 degrees C). Even under conditions of continuous dark or light, ovarian development occurred as a function of warm temperatures. Gravid ovaries were maintained beyond the spawning period only with a temperature of 30 degrees C, photoperiod notwithstanding. Nevertheless, moderate or cool temperatures did not prevent the ovarian regression that occurred by the first week of October in the post-spawning period. Regulation of ovarian activity at least in part by an endogenous circannual rhythm appears possible.

PMID: 965909 [PubMed - indexed for MEDLINE]

17: Gen Comp Endocrinol. 1976 May;29(1):84-96.

Effects of melatonin and prolactin treatment on the hypophysial-ovarian system in the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Keshavanath P.

PMID: 939419 [PubMed - indexed for MEDLINE]

18: Can J Zool. 1976 Feb;54(2):285-92.

Maintenance of spermatogenesis and seminal vesicles in the hypophysectomized catfish, *Heteropneustes fossilis* (Bloch): effects of ovine and salmon gonadotropin, and testosterone.

Nayyar SK, Keshavanath P, **Sundararaj BI**, Donaldson EM.

PMID: 1253020 [PubMed - indexed for MEDLINE]

19: Chronobiologia. 1975 Jul-Sep;2(3):224-39.

Responses of the regressed ovary of the catfish, *Heteropneustes fossilis* (Bloch), to interrupted-night photoperiods.

Vasal S, **Sundararaj BI**.

Interrupted-night photoperiod schedules were used to explore the possibility of the involvement of a circadian rhythm in photosensitivity in ovarian recrudescence in the catfish, *Heteropneustes fossilis*. Interruption of the night of a basic short day (L/D 6:18) treatment by 1-h of light between 00(00) and 01(00) induced ovarian recrudescence which was significantly higher than that in the control group exposed to L/D 7:17. Scanning of the major part of the dark period (20(00)-05(00)) to determine the duration of the photo-inducible phase shows that the photo-inducible phase lies between 20(00) and 03(00) with a peak from 00(00) to 01(00). Even 1-h of light in a regimen of L/D 1:23 presented between 20(00)-21(00), 22(00)-23(00), 00(00)-01(00), 02(00)-03(00), or 04(00)-05(00), produced significant ovarian recrudescence with a peak between 22(00) and 23(00). These results provide a clear demonstration of the possible involvement of a circadian mechanism for photoperiod measurement in the catfish.

PMID: 1218505 [PubMed - indexed for MEDLINE]

20: Acta Anat (Basel). 1975;93(1):141-50.

Response of the pituitary of the catfish, *Heteropneustes fossilis* (Bloch), to bilateral ovariectomy.

Anand TC, **Sundararaj BI**.

Hypophyseal response to bilateral ovariectomy was studied in the catfish, *Heteropneustes fossilis*, during the prespawning (May) and the spawning (July) periods. During the prespawning period, a significant increase in the number of granulated PAS-positive basophils in the proximal pars distalis of the castrates was recorded on day 45 post-ovariectomy; thereafter a gradual degranulation of basophils was observed. However, in the spawning period a dramatic increase in the number of granulated basophils of the

castrates was seen on day 8 post-ovariectomy and the number decreased thereafter. This differential response of the hypophysis to ovariectomy is discussed.

PMID: 1189895 [PubMed - indexed for MEDLINE]

21: Acta Anat (Basel). 1975;93(3):376-86.

Response of the hypothalamic neurosecretory system of the female catfish, *Heteropneustes fossilis* (Bloch), to hypophysectomy.

Viswanathan N, **Sundararaj BI.**

The effect of hypophysectomy on the hypothalamic neurosecretory system of the catfish, *H. fossilis*, was studied. Hypophysectomy resulted initially in an accumulation of NSM at the distal ends of the cut axons. The axons had grown and were reorganized into a neurohypophysis-like structure 3 weeks after hypophysectomy, and this persisted even more than 3 years post-hypophysectomy.

PMID: 1963 [PubMed - indexed for MEDLINE]

22: Gen Comp Endocrinol. 1974 Jul;23(3):282-5.

Effects of C18, and C21 steroids in vitro maturation of oocytes of the catfish, *Heteropneustes fossilis* (Bloch).

Goswami SV, **Sundararaj BI.**

PMID: 4851788 [PubMed - indexed for MEDLINE]

23: Gen Comp Endocrinol. 1974 Jul;23(3):276-81.

Effects of ovine luteinizing hormone and porcine adrenocorticotropin on maturation of oocytes of the catfish, *Heteropneustes fossilis* (Bloch), in ovary-interrenal coculture.

Sundararaj BI, Goswami SV.

PMID: 4368650 [PubMed - indexed for MEDLINE]

24: Can J Zool. 1974 Jun;52(6):745-8.

In vitro maturation response of oocytes of the catfish *Heteropneustes fossilis* (Bloch) to salmon gonadotropin in ovary-head kidney co-culture.

Goswami SV, **Sundararaj BI**, Donaldson EM.

PMID: 4837267 [PubMed - indexed for MEDLINE]

25: Cell Tissue Res. 1974 Apr 30;148(3):347-58.

The cell-types in the adenohypophysis of the Indian catfish *Heteropneustes fossilis* (Bloch).

Baker BI, Keshavanath P, **Sundararaj BI**.

PMID: 4364850 [PubMed - indexed for MEDLINE]

26: Gen Comp Endocrinol. 1974 Feb;22(2):154-68.

Ovarian maintenance in the hypophysectomized catfish, *Heteropneustes fossilis* (Bloch), with mammalian hypophyseal and placental hormones, and gonadal and adrenocortical steroids.

Anand TC, **Sundararaj BI**.

PMID: 4360913 [PubMed - indexed for MEDLINE]

27: Neuroendocrinology. 1974;16(3-4):212-24.

Response of the hypothalamo-hypophysial-ovarian system of the catfish, *Heteropneustes fossilis* (Bloch), to administration of estrogen and androgen.

Viswanathan N, **Sundararaj BI**.

PIP: The response of the hypothalamo-hypophysial-ovarian system of the catfish, *Heteropneustes fossilis* (Bloch), to the administration of estrogen and androgen is reported. Estradiol benzoate (2.5 or 5 mcg/day) or testosterone propionate (50 mcg/day) was administered for 30 days during the prespawning and spawning periods. 2.5 mcg of estradiol benzoate was ineffective but 5 mcg produced a significant decrease in neurosecretory material (NSM) in the nucleus preopticus (NOP; p less than .005) and in the nucleus lateralis tuberis (NLT; p less than .001). Testosterone propionate did not cause any marked reduction in the NSM quantity in the NPO, however, a significant reduction was seen in the NLT (p less than .001). Treatment also brought about a

reduction in the size and number of basophils in the pituitary and the inhibition of vitellogenesis in the ovaries. Cessation of treatment resulted in a restoration of the activity of the NLT, the hypophysis, and the ovaries. These results offer evidence supporting hypothalamic regulation of reproductive functions of the hypophysis comparable to the regulation seen in higher vertebrates.

PMID: 4449587 [PubMed - indexed for MEDLINE]

28: Neuroendocrinology. 1974;15(3-4):158-71.

Temporal effects of artificial induction of ovulation on the hypothalamo-hypophysial-ovarian system of the catfish, *Heteropneustes fossilis* (Bloch).

Anand TC, **Sundararaj BI.**

PMID: 4138699 [PubMed - indexed for MEDLINE]

29: J Exp Zool. 1973 Sep;185(3):327-32.

Effect of actinomycin D, mitomycin C, puromycin, and cycloheximide on desoxycorticosterone-induced in vitro maturation in oocytes of the catfish, *Heteropneustes fossilis* (Bloch).

Goswami SV, **Sundararaj BI.**

PMID: 4748951 [PubMed - indexed for MEDLINE]

30: J Endocrinol. 1972 Jul;54(1):87-98.

Effects of carp pituitary fractions on vitellogenesis, ovarian maintenance, and ovulation in hypophysectomized catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Anand TC, Sinha VR.

PMID: 5046596 [PubMed - indexed for MEDLINE]

31: Biol Bull. 1972 Apr;142(2):243-50.

Endocrine influences on seminal vesicles in the estuarine gobiid fish, *Gillichthys mirabilis*.

De Vlaming VL, **Sundararaj BI.**

PMID: 5021126 [PubMed - indexed for MEDLINE]

32: Gen Comp Endocrinol. 1972 Feb;18(1):102-14.

Effects of partially purified salmon pituitary gonadotropin on ovarian maintenance, ovulation, and vitellogenesis in the hypophysectomized catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Anand TC, Donaldson EM.

PMID: 5009668 [PubMed - indexed for MEDLINE]

33: J Exp Zool. 1971 Dec;178(4):457-65.

Temporal effects of ovine luteinizing hormone and desoxycorticosterone acetate on maturation and ovulation of oocytes of the catfish, *Heteropneustes fossilis* (Bloch): an in vivo and in vitro study.

Goswami SV, **Sundararaj BI**.

PMID: 5161045 [PubMed - indexed for MEDLINE]

34: Gen Comp Endocrinol. 1971 Dec;17(3):570-3.

Effects of desoxycorticosterone and hydrocortisone singly and in various combinations on in vitro maturation of oocytes of the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Goswami SV.

PIP: The effects of desoxycorticosterone (DOC) and hydrocortisone alone and in various combinations on the in vitro maturation of catfish (*Heteropneustes fossilis*) oocytes were evaluated. Gravid specimens were obtained from the Jamuna River, were acclimated to the laboratory, and were sacrificed to culture the ovaries with DOC and/or hydrocortisone. The best dose-response curves indicated that DOC was nearly 5 times more potent than hydrocortisone at comparable dosages. 1 mcg/ml of DOC caused maturation in 28% of the oocytes; however when combined with .4 mcg/ml of hydrocortisone a synergistic response (p less than .025) was obtained. 2 mcg/ml of DOC induced maturation in 42% of the oocytes and when combined with .4 mcg/ml hydrocortisone a significantly (p less than .001) larger number of oocytes matured.

PMID: 5128305 [PubMed - indexed for MEDLINE]

35: J Exp Zool. 1971 Dec;178(4):467-77.

In vitro maturation and ovulation of oocytes of the catfish, *Heteropneustes fossilis* (Bloch): effects of mammalian hypophyseal hormones, catfish pituitary homogenate, steroid precursors and metabolites, and gonadal and adrenocortical steroids.

Goswami SV, **Sundararaj BI.**

PMID: 4334421 [PubMed - indexed for MEDLINE]

36: J Reprod Fertil. 1971 Nov;27(2):292-3.

Effects of partially purified salmon pituitary gonadotrophin on re-initiation of spermatogenesis in the long-term hypophysectomized catfish, *Heteropneustes fossilis*.

Sundararaj BI, Nayyar SK, Anand TC, Donaldson EM.

PMID: 5125021 [PubMed - indexed for MEDLINE]

37: Gen Comp Endocrinol. 1971 Aug;17(1):73-82.

Effects of salmon pituitary gonadotropin, ovine luteinizing hormone, and testosterone on the testes and seminal vesicles of hypophysectomized catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Nayyar SK, Anand TC, Donaldson EM.

PMID: 5559136 [PubMed - indexed for MEDLINE]

38: Ann Histochem. 1971 Apr-Jun;16(2):155-64.

Histochemistry of the saccus vasculosus of some fresh water teleosts.

Narasimhan PV, **Sundararaj BI.**

PMID: 5558643 [PubMed - indexed for MEDLINE]

39: J Comp Neurol. 1971 Jan;141(1):95-106.

Hypothalamo-hypophyseal neurosecretory and vascular systems in the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Viswanathan N.

PMID: 4099211 [PubMed - indexed for MEDLINE]

40: Biol Reprod. 1970 Jun;2(3):425-34.

Responses of the pituitary and ovary of the catfish, *Heteropneustes fossilis* (Bloch) to accelerated light regimen of a decreasing followed by an increasing photoperiod during the postspawning period.

Sundararaj BI, Sehgal A.

PMID: 5527840 [PubMed - indexed for MEDLINE]

41: Biol Reprod. 1970 Jun;2(3):425-34.

Effects of various photoperiodic regimens on the ovary of the catfish, *Heteropneustes fossilis* (Bloch) during the spawning and the postspawning periods.

Sehgal A, **Sundararaj BI**.

PMID: 5527839 [PubMed - indexed for MEDLINE]

42: Biol Reprod. 1970 Jun;2(3):413-24.

Effects of a long or an increasing photoperiod on the initiation of ovarian recrudescence during the preparatory period in the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Sehgal A.

PMID: 5527838 [PubMed - indexed for MEDLINE]

43: J Exp Zool. 1969 Dec;172(4):399-408.

Effects of estrogen, SU-9055, and cyproterone acetate on the hypersecretory activity in the seminal vesicles of the castrate catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Nayyar SK.

PMID: 5373343 [PubMed - indexed for MEDLINE]

44: J Exp Zool. 1969 Dec;172(4):385-98.

Effect of pituitary hormones, androgens, and corticosteroids on the seminal vesicles of the castrate catfish, *Heteropneustes fossilis* (Bloch).

Nayyar SK, **Sundararaj BI**.

PMID: 5373342 [PubMed - indexed for MEDLINE]

45: J Exp Zool. 1969 Dec;172(4):369-84.

Effects of castration and-or hypophysectomy on the seminal vesicles of the catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Nayyar SK.

PMID: 5373341 [PubMed - indexed for MEDLINE]

46: J Exp Zool. 1968 Oct;169(2):211-9.

Effects of estrogen, progesterone, and testosterone on the pituitary and ovary of catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Goswami SV.

PMID: 5703839 [PubMed - indexed for MEDLINE]

47: Gen Comp Endocrinol. 1968 Oct;11(2):401-13.

Compensatory hypertrophy of the remaining ovary after unilateral ovariectomy at various phases of the reproductive cycle of catfish, *Heteropneustes fossilis* (Bloch).

Goswami SV, **Sundararaj BI**.

PMID: 5682914 [PubMed - indexed for MEDLINE]

48: Gen Comp Endocrinol. 1968 Oct;11(2):393-400.

Effect of estradiol benzoate, human chorionic gonadotropin, and follicle-stimulating hormone on unilateral ovariectomy-induced compensatory hypertrophy in catfish, *Heteropneustes fossilis* (Bloch).

Goswami SV, **Sundararaj BI**.

PMID: 5682913 [PubMed - indexed for MEDLINE]

49: J Exp Zool. 1968 May;168(1):85-103.

Effect of short- and long-term hypophysectomy on the ovary and interrenal of catfish, *Heteropneustes fossilis* (bloch).

Sundararaj BI, Goswami SV.

PMID: 5700168 [PubMed - indexed for MEDLINE]

50: Acta Anat (Basel). 1968;69(2):282-6.

An autoradiographic study of the saccus vasculosus of *Notopterus* sp. (Teleostei) by administration of NA2S35 O4.

Sundararaj BI, Narasimhan PV.

PMID: 4233485 [PubMed - indexed for MEDLINE]

51: Gen Comp Endocrinol. 1967 Jun;8(3):403-16.

Effects of exogenous gonadotrophins and gonadal hormones on the testes and seminal vesicles of hypophysectomized catfish, *Heteropneustes fossilis* (bloch).

Sundararaj BI, Nayyar SK.

PMID: 6034718 [PubMed - indexed for MEDLINE]

52: J Exp Zool. 1966 Oct;163(1):49-54.

Effect of metopiron (SU-4885) on luteinizing hormone and corticosteroid-induced ovulation and spawning in hypophysectomized catfish, *Heteropneustes fossilis* (bloch).

Sundararaj BI, Goswami SV.

PMID: 6008027 [PubMed - indexed for MEDLINE]

53: J Exp Zool. 1966 Mar;161(2):287-95.

Effects of mammalian hypophysial hormones, placental gonadotrophins, gonadal hormones, and adrenal corticosteroids on ovulation and spawning in hypophysectomized catfish, *Heteropneustes fossilis* (Bloch).

Sundararaj BI, Goswami SV.

PMID: 4289694 [PubMed - indexed for MEDLINE]

54: Indian J Exp Biol. 1966 Jan;4(1):4-6.

Effects of hormones on liver & saccus vasculosus glycogen in *Notopterus notopterus* (Teleostei).

Kumar M, **Sundararaj BI**, Narasimhan PV, Prasad MR, Venkitasubramanian TA.

PMID: 5940643 [PubMed - indexed for MEDLINE]

55: Indian J Exp Biol. 1966 Jan;4(1):1-3.

Effects of starvation & glucose administration on carbohydrate metabolism of saccus vasculosus & liver of *Notopterus notopterus* (teleostei).

Sundararaj BI, Kumar M, Narasimhan PV, Prasad MR, Venkitasubramanian TA, Malathy J.

PMID: 5939203 [PubMed - indexed for MEDLINE]

56: Gen Comp Endocrinol. 1965 Aug;5(4):464-74.

Seminal vesicle' response of intact, castrate, and hypophysectomized catfish, *Heteropneustes fossilis* (Bloch), to testosterone propionate, prolactin, and growth hormone.

Sundararaj BI, Goswami SV.

PMID: 5892988 [PubMed - indexed for MEDLINE]

57: Acta Anat (Basel). 1959;37:47-80.

A study on the correlation between the structure of the pituitary gland of the Indian catfish *Heteropneustes* and the seasonal changes in the ovary.

Sundararaj BI.

PMID: 13835709 [PubMed - OLDMEDLINE for Pre1966]

58: Acta Endocrinol (Copenh). 1958 Feb;27(2):253-6.

Action of enzymes on the gonadotrophic activity of pituitary extracts of the Indian catfish *Heteropneustes*.

Ramaswami LS, **Sundararaj BI.**

PMID: 13497539 [PubMed - OLDMEDLINE for Pre1966]

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