

THE INFLUENCE OF PHYSICAL CONDITIONS (SALT CONTENT) OF THE FLESH OF FISH ON THE INTENSITY OF INFESTATION BY ADULT MITE *SUIDASIA MEDANENSIS*

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LEVELS OF SALT AND ABUNDANCE OF ACARIDIAE
ABSTRACT : Salted sun-dried samples of the flesh of three different species of fish with different levels of salt in the flesh were exposed to infestation by the mite *Suidasia medanensis* in the laboratory under uniform conditions. Statistical analysis of the results obtained after one week's exposure showed that there is no correlation between the level of salt retained in the flesh and the number of mites infesting it. It would appear, however, from the results that there may well be a critical level of salt content above which infestation does not occur.

NIVEAUX DU SEL ET ABONDANCE DES ACARIENS
RÉSUMÉ : Des lots de chair de poisson salés et séchés au soleil, représentant trois espèces de poissons et des niveaux de sel différents, ont été soumis à l'infestation de l'acarien *Suidasia medanensis* en laboratoire et dans des conditions uniformes.

L'analyse statistique des résultats obtenus, après une exposition d'une semaine, a montré qu'il n'y a aucune corrélation entre le niveau du sel retenu dans la chair et le nombre d'acariens qui l'infestent. Il semblerait, toutefois, d'après ces résultats, qu'il pourrait bien y avoir un niveau critique pour le sel au dessus duquel l'infestation ne se produirait plus.

INTRODUCTION

S. medanensis has so far been principally recognised as a pest of stored grain. PILLAI, 1957) listed *S. medanensis* in the group of fish-mites. In view of its economic importance a detailed study of the ecology of the mite was undertaken and the present paper reports the influence of the levels of salt content of the flesh of the dried fish on the intensity of infestation by the mite.

MATERIAL AND METHODS

Known proportions of salt by weight were added to fresh samples of different species of fish which were then sun-dried. The dried samples were then cut into four sub-samples of more or less equal weight. Of the four sub-samples one was used to determine the percentage by weight of retained salt and the others exposed to infestation. It was presumed that the salt content of the four sub-samples would be uniform.

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The salt content of the control piece/gm was determined in the following way.

The unexposed piece was repeatedly extracted with hot water (80°C) till it was ensured that the entire salt present in the flesh was dissolved. The salt solution was then titrated against standard silver nitrate solution using potassium chromate as indicator and the weight of salt/gm of flesh was calculated.

The experimental pieces were weighed and subjected to uniform chances of infestation by arranging them equidistantly around a stock culture of *Suidasia* in the laboratory. The pieces exposed for infestation were withdrawn after seven days interval and the number of adult mites on a weight of 10 gms of the sample was counted. Six levels of salt were tried in the flesh of each of the three different species of hosts. For each level of salt tried the intensity was determined based on the average of the counts of the mite on three samples subjected to infestation separately, each of one week's duration. The species of fish used were *Trichiurus savala*, *Euthynnus affinis* and *Otolithus argenteus*.

RESULTS

The levels of salt added initially and those retained in the flesh after drying and the relative intensity of the mite under each level are given in Table 1. Correlations between the salt added initially and the intensity of the mite on samples of three species of fish are given in Tables IA, IB and IC.

From the tables it will be seen that statistically significant correlation between the salt added and salt retained and the intensity of infestation of the mite is present only in the case of *T. savala*. A significant correlation between the salt added initially and the intensity of *S. medianensis* is seen in *O. argenteus* also. It would, therefore, appear that a firm conclusion cannot be reached regarding the correlation between the levels of salt content of the flesh and the intensity of *Suidasia* on the flesh.

TABLE 1. — Intensity of infestation under each level of salt added and salt retained.

Name of species	Percentage weight of salt added initially for curing	Percentage weight of salt present in the sample before exposure	Average number of adult <i>Suidasia</i> on unit weight
<i>Trichiurus savala</i>	1.5	0.7845	180
	2	1.084	200
	2.5	1.161	100
	5	1.334	200
	10	2.028	0
	15	4.67	50
	20	7.683	0
	25	8.565	0
<i>Euthynnus affinis</i>	1.5	0.0873	100
	2	0.1052	73
	2.5	0.7446	250
	5	1.426	210
	10	2.167	0
	15	2.471	0
	20	5.261	0
	25	6.371	0
<i>Otolithus argenteus</i>	1.5	0.5706	300
	2	0.8650	525
	2.5	1.012	450
	5	1.224	75
	10	2.075	25
	15	4.625	0
	20	8.425	0
	25	8.515	0

TABLE I A. — Correlation between the tested levels of salt content and intensity of infestation in *T. savala*.

Salt added initially (percentage by weight)	Intensity of infestation (average no.)	Salt retained in the flesh after curing (percentage by weight)	Intensity of infestation (average no.)
X	Y	X	Y
1.5	180	0.7845	180
2	200	1.084	200
2.5	100	1.161	100
5	200	1.334	200
10	0	2.028	0
15	50	4.67	50
20	0	7.683	0
25	0	8.565	0

$r = -0.8210$
Significant at 5 % level

$r = -0.8657$
Significant at 1 % level

Tables IA, IB and IC show a negative trend in the relation between the salt added, salt retained and the number of mites present on the flesh. Consequent to this negative trend, when the

TABLE I B. — Correlation between the tested levels of salt content and intensity of infestation in *E. affinis*.

Salt added initially (percentage by weight)	Intensity of infestation (average no.)	Salt retained in the flesh after curing	Intensity of infestation (average no.)
X	Y	X	Y
1.5	100	0.0873	100
2	73	0.1052	73
2.5	250	0.7446	250
5	210	1.426	210
10	0	2.167	0
15	0	2.471	0
20	0	5.261	0
25	0	6.371	0
$r = -0.6951$		$r = -0.5863$	
Not significant		Not significant	

TABLE I C. — Correlation between the tested levels of salt content and intensity of infestation in *O. argenteus*.

Salt added initially (percentage by weight)	Intensity of infestation (average no.)	Salt retained in the flesh after curing (percentage by weight)	Intensity of infestation (average no.)
X	Y	X	Y
1.5	300	0.5706	300
2	525	0.8650	525
2.5	450	1.012	450
5	75	1.224	75
10	25	2.075	25
15	0	4.625	0
20	0	8.425	0
25	0	8.515	0
$r = -0.7615$		$r = -0.6551$	
Significant at 5 % level		Not significant	

salt content is increased there is reduction in the number of mites ; beyond about 2 % by weight of retained salt there is absolutely no infestation. So the present study indicates that even though there is no correlation between the salt level and the number of *Suidasia*, salt content above a particular level may be useful as a prophylactic agent against the infestation by *S. medanensis*.

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REFERENCE

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