


TRANSCRIPTOMIC CHARACTERIZATION OF ANTIMICROBIAL PEPTIDES IN *Physalaemus santafecinus* AND THEIR ROLE IN FOAM NEST CONSTRUCTION

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WHAT'S THE FUNCTION OF AMPs IN NEST PROTECTION?



The nest's formation involves **protein secretions** from the **oviduct** followed by a series of **fast kicking of the hind legs** by the amplexant pair.

Skin's antimicrobial **peptides** may be incorporated to the foam and **modulate microbiome**.

TRANSCRIPTOME ASSEMBLY

Transcriptome assembly was performed using a combination of software tools to ensure comprehensive coverage and accuracy. **Trinity** and **Spades** for de novo assembly. **Transdecoder** and **Orfpredictor** for translation and identification of open reading frames (ORFs).

RESULTS

>GRLTWK
>RRRRGT
>DRKSVV
>GSETGRRGGA
>KPQFFLTDNLLPLP
>LARPPYKGLCGPNFLDMC
>GKIDFMKKAIAEKMMQMKV*
>DEKRSKPNKPYIFERDLQ
>LARPPYKGLCGPNFLDMC
>LERPPFHGRWCDSYSLNIT
>GVLSKVMGAIISGMLKIGK*
>LERPPFHGRWCDSYSLNICP
>GHHHRKERSEERRVGEKNL
>VEKRSRFDDEFWAGLNVDI
>QFPFLGEEKRRRGRSGEKCRK
>FFQLLPWITTEGQIGRADVCSDDLRRGT
>GHHHRKEEEEEHGTAREKRGHHHRKEEEEE
>RSGWVKEEAEEDGITREKWKCRKDSIKHDYQF
>GLKDIKFKVVGKIAGVVAEALNKQIGRASCRESRV*
>IIPCCLKAFKLYEKFADPSLNCDFSKFEYESKQNK
>EDEGEHEKEREARDDYTDLMKNVASSRNGWTKFYGGK
>RLRLCTGRKRLLEDAENQERSAKRRLRLCVRNKRHLEDAEN
>GMLSNVLGAIAEFLRKSQSHYGVAVREVTLWSLYCKSSHTMVSLL*
>LVEPTKPPYILYPRVLRKWVTHRGGEMLGGQFNPLTTWVQKLYGSASD
ILLPGLCLDGHQCKQ*

>TWYPI
>QFPFLGEEKR
>MLSLGFAMKNNNG
>FFQLLPWITTEGQTSK
>TMPLGWYALKSLGINVV
>RLRLCVRNKRHLEDAEN*
>IVSYPPRSRVAVYPPPWIPP
>AGYLGKDPOLYPRLGGPICKN
>EEAHVCYFERNAPHKSCSPLIEI
>GLLNADPVIAAHGLTGGIGLGIK
>EVEDSENQERDAERLLIPFLIFPG
>GKIDFMKKAIAKVVQGIAGVVAEALNKPPQ*
>GLKMLKNLAKKVAGKIVGVVAGALGEQPPQ*

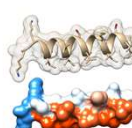
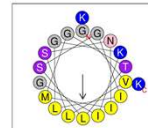
>GRLTWC
>RTWYPI
>SDKNPKRPYILRDLQ
>GVSDFADAWKMAAY
>LVDLTGLCIDGHGQCKQ
>SFPYFSPSEIAELNSNS
>RNRFDDEFWAGLNVDI
>LARPPYKGLCGPNFLDMC
>GSLSDFAEAWQESALVTKPI
>GVVGSVDFIKNIAGRNGKK*
>GVLSNIMGTLGSLIGKTKK*
>DEDVSGQMMGPPMAATTVVTPPLP
>ELSPERIESLKKMYSGHHGNNLLG
>GLKDIKFKVVGKIAGVVAEALNKPPQ*
>QLRPEEIAEYERITGRPYKGMWMLRTGA
>EEEEEREVEVAENQQRDIKTPSFEDVFGG
>EDEEHEKEREARDDYTDLMKNVASSRNGWTKFYGGK
>EEVVGNDENRSVEPTKPPYILYPERLLKWVYTHRGGEML
HSSGQFHPLT

+ OVIDUCT

>GRLTW
>EVEDSENQERDAERLLIP

*predicted as AMPs
KR could be a processing site

Transcriptome from dorsal skin region of male and female and oviduct assess AMP gene expression and revealed **diverse peptide profiles**

Most predicted AMPs are **cationic, amphipathic and >40% hydrophobic**

Sequence	Antimicrobial Peptide Scanner			Physicochemical properties	
	Random Forest Class	Gram negative	Gram positive	Length	% Hydrophobicity Net charge
GLKIDFKVVGKIAGVVAEALNKPPQ	AMP	0.6	0.4	26	46 3
GKIDFMKKAIAEKMMQMKV	AMP	0.58	0.42	19	47 4
GLKIDFKVVGKIAGVVAEALNKQIGRASCRESRV	AMP	0.56	0.44	34	47 5
GKIDFMKKAIAEKMMQMKVGGVVAEALNKPPQ	AMP	0.56	0.44	30	43 3
GLKMLKNLAKKVAGKIVGVVAGALGEQPPQ	AMP	0.62	0.38	30	47 3
GMLSNVLGAIAEFLRKSQSHYGVAVREVTLWSLYCKSSHTMVSLL*	AMP	0.16	0.84	20	45 3
GVLSNIMGTLGSLIGKTKK*	AMP	0.28	0.72	20	40 3
GVVGSVDFIKNIAGRNGKK	AMP	0.14	0.86	20	45 3
GVVGSVDFIKNIAGRNGKK	AMP	0.2	0.8	20	45 3
GVVGSVDFIKNIAGRNGKK	AMP	0.11	0.89	20	40 3
GVLSKVMGAIISGMLKIGK*	AMP	0.28	0.72	20	45 4
GLLNADPVIAAHGLTGGIGLGIK	AMP	0.56	0.44	25	52 0

Through an integrated analysis encompassing **morphological, biochemical, and microbiota characterization** of skin, nest, and environment, this study will offer a comprehensive understanding of foam nest composition and structure. These findings will provide crucial insights into the reproductive mechanism and the pivotal **role of secretions** in foam nest construction.