

Algal bloom wildlife post-mortem report



Species – Little penguin

Date collected – 1 July 2025

Location – Victor Harbor and Goolwa Beach

History relating to the animal

Two adult little penguins (*Eudyptula minor*) were found dead on beaches of the Fleurieu Peninsula. One washed up on the beach at Goolwa (Penguin 1), and the second on the beach at Victor Harbor on 1 July 2025.

Clinical examination

Both animals were already dead and so could not be examined prior to death. Both animals were noted to have puncture wounds on their body.

Necropsy

The necropsies (looking at the whole body) revealed that both little penguins were in good condition with adequate muscle coverage. There was moderate post-mortem autolytic change (decomposing after death).

Both penguins had a puncture wound to the lower belly area, with internal organs visible through the hole. There was no inflammation surrounding the wounds, indicating they likely occurred after death.

Penguin 1 had a well demarcated (well defined edges), round, hard, yellow nodule (lump) next to the heart (approximately 4 x 3 x 3cm). When cut in half, the centre of the nodule was made out of a hard, irregular, gritty, and yellow material which was easily removed from the outer layer of thickened fibrous connective tissue.

Penguin 2 had single, round, white and well-demarcated (defined edges) lesion within the liver.

Both penguins had empty gizzards (the muscular part of a bird's stomach) and brown, pasty intestinal contents.

For both birds, samples were collected to test for avian influenza and Newcastle disease. Tissues were collected for histopathology (looking at tissues under the microscope for more detailed information), with additional samples collected to test for brevetoxins and other algal biotoxins (a possibility due to the algal bloom).

Histopathology

For both birds, samples from every major body system were examined under the microscope.

In Penguin 1, examination of the heart nodule showed inflammatory cells, tissue necrosis (decomposition) and organisms that resembled fungal hyphae, surrounded by a layer of

Algal bloom wildlife post-mortem report



granulation tissue (body trying to contain an area of infection). Inflammation was found in the liver, spleen, kidney and proventriculus (glandular stomach in birds). There was mild-moderate autolysis (decomposition) of the spleen, kidney and proventriculus, with a focal, ulcerative lesion (localised ulcer) within the proventriculus. Large roundworms (parasites) were found in one section of the gut.

In Penguin 2, there were multiple areas of inflammation in the liver, especially around blood vessels. One area showed chronic (long-term) inflammation with bile duct changes, and organisms (likely bacteria) were seen surrounded by immune cells, indicating infection. There was mild-moderate autolysis (decomposition) and inflammation in the liver, spleen, kidney and small intestines. There were structures within the kidneys that appeared to be parasitic worm eggs.

Virology

Testing results for avian influenza and Newcastle disease were negative for both birds.

Brevetoxins

No samples were above the limits of reporting.

Other algal biotoxins

No samples were above the limits of reporting.

Summary

PENGUIN 1

Two adult little penguins were found dead on beaches of the Fleurieu Peninsula. Both birds were in good body condition. Laboratory examination could not identify the cause of death of either penguin, however multiple processes likely contributed to their illness and possibly death.

Penguin 1 had signs consistent with a chronic (long-term) infection in the air sacs caused by fungi, with secondary (subsequent) bacterial infection. The fungal infection is a common lesion in birds, especially those that are immunosuppressed. This bird also had signs of inflammation in many organs and some gut parasites.

Penguin 2 had a chronic (long-term) infection in the liver, which could have been caused by fungi or bacteria. The bird also had parasites in the kidneys.

Testing for avian influenza and Newcastle disease was negative in both birds. Brevetoxins and other algal biotoxins were also not detected.

PATH RESULTS: LITTLE PENGUIN, (Wi) [REDACTED]

From [REDACTED]

Date Wed 13/08/2025 5:00 PM

To [REDACTED]

[REDACTED]

Tested on 01/07/25
Reported on 13/08/25 17:30
Referred on 01/07/25 **by:**

[REDACTED]

[REDACTED]

Owner:
LITTLE PENGUIN
VICTOR HARBOR 5211

Animal/s:
Wild Birds
DOB: N/A

Collected: 01/07/25 09:00 **Subm.No:** [REDACTED]

Lab No.: [REDACTED]

Samples tested as received

All Tests Complete

HISTOPATHOLOGY FROM NECROPSY

REF: [REDACTED]
CLINICAL HISTORY
Please see submission form.

MACROSCOPY
Penguin 1 = pot 1
Penguin 2 = pot 2

1A = granuloma
2A = liver with nodule

B = lung, liver, spleen
C = skeletal muscle
D = GIT sections
E = brain
F = eye and trachea

MICROSCOPY

Penguin 1

Nodule next to heart, suspect air sac: This section consist of moderate numbers of inflammatory cells (mostly degenerate heterophils) embedded within an extensive matrix of (coagulative) necrosis. There are multiple suspicious negative-staining organisms that resemble fungal hyphae seen within the mass.

The necrosis is surrounded by a layer of granulation tissue and occasional adipose tissue. Low numbers of heterophils and macrophages are seen within the surrounding granulation tissue.

Liver: Multifocally there are moderate numbers of small lymphocytes and plasma cells around the periportal regions.

Lung: The blood capillaries are mildly congested. There are occasional small lymphocytes and plasma cells in the air capillary septa.

Spleen: There is moderate autolysis. The follicles are mildly expanded by small lymphocytes (lymphoid hyperplasia), and a moderate increase in plasma cells. Mild increase numbers of heterophils are seen within the red pulp.

Skeletal muscle: There is a focal area of low numbers of heterophils

[REDACTED]

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Animal/s:
Wild Birds

VICTOR HARBOR 5211

DOB: N/A

Collected: 01/07/25 09:00

Subm.No: [REDACTED]

Lab No.: [REDACTED]

Samples tested as received
within the interstitium.

All Tests Complete

Kidney: There is moderate autolysis. The glomeruli appears to be mildly expanded by smudgy eosinophilic material (query amyloid vs autolysis). Within the interstitium are multifocal moderate accumulations of plasma cells, small lymphocytes and heterophils.

Proventriculus: There is mild-moderate autolysis. There is a focal ulcerative lesion, accompanied by underlying granulation tissue with low numbers of heterophils, small lymphocytes and plasma cells.

GIT - in one section there is a large, and several smaller roundworms within he lumen.

Brain, eye, trachea, heart: No significant findings.

Penguin 2

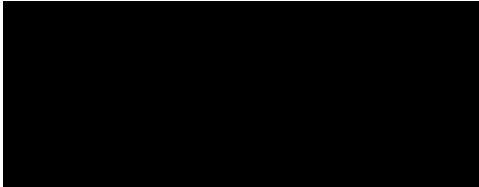
Liver: Multifocally around the periportal regions are moderate numbers of plasma cells and small lymphocytes (periportal, lymphoplasmacytic). In one focal area, surrounding a vessel, is a poorly demarcated area of inflammation with moderate biliary hyperplasia and fibrosis. It is characterized by large numbers of plasma cells, small lymphocytes with lesser numbers of macrophages and heterophils. Multinucleated giant cells are occasionally seen (granulomatous inflammation). Within the vessel, there are multiple organisms that are of two different populations: The first population is approximately 10um, rod-like and basophilic organisms. These occasionally have a oval and pin-shaped head (reminiscent of sperm?). The second organism is smaller, round to oval, signet ring-like structures that are approximately 2.5um long. The organisms are surrounded by moderate numbers of plasma cells

and small lymphocytes.

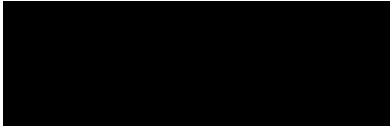
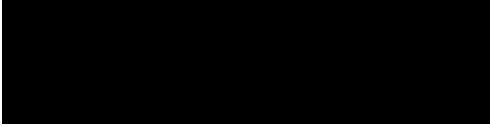
Kidney: There is moderate autolysis. Multifocally within the area of the renal pelvis are a sheet of round structures (reminiscent of parasite eggs). The structures are approximately 50-80 microns diameter, round with a thinned eosinophilic wall, which contains one single (degenerate) organism surrounded by a clear central core.

Low to moderate numbers of small lymphocytes and plasma cells are seen within the interstitial space.

Spleen: There is mild-moderate autolysis. Multifocally within the red



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DOB: N/A

Collected: 01/07/25 09:00 **Subm.No:**  **Lab No.:** 

Samples tested as received All Tests Complete

pulp are increased numbers of macrophages and heterophils. The follicles are mildly expanded due to mild increase numbers of small lymphocytes (likely lymphoid hyperplasia).

Skeletal muscle: There is a focal area of perivascular to interstitial accumulation of moderate numbers of plasma cells, small lymphocytes and heterophils.

Intestine: Majority of sections are moderately autolysed. In one small intestinal section, there is diffuse infiltration of the lamina propria by large numbers of small lymphocytes and plasma cells, with lesser numbers of macrophages. The underlying lymphoid follicles are hyperplastic.

Brain, eye, trachea, heart, lung: No significant findings.

DIAGNOSIS

Penguin 1:
 Nodule next to heart, suspect air sac: locally extensive, large, pyogranulomatous to granulomatous air sacculitis with suspected intralesional fungal hyphae

Liver: Multifocal, moderate, subacute, periportal lymphoplasmacytic hepatitis

Spleen: Mild heterophilic splenitis with moderate lymphoid hyperplasia

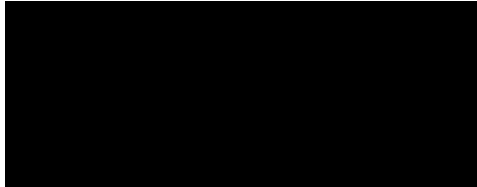
Kidney: Moderate, multifocal, chronic lymphoplasmacytic interstitial nephritis

Kidney: Multifocal, chronic, mild to moderate, protein accumulation within glomerulus (suspect amyloid)

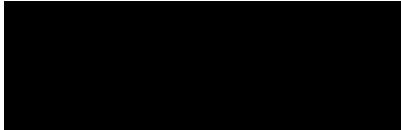
Proventriculus: Focal, ulcerative, mild, chronic proventriculitis with granulation tissue formation.

Penguin 2:

Liver: Locally extensive, chronic, marked pyogranulomatous to granulomatous hepatitis with intralesional organisms



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DOB: N/A

Collected: 01/07/25 09:00 **Subm.No:**  **Lab No.:** 

Samples tested as received All Tests Complete

Liver: Multifocal, moderate, subacute, periportal lymphoplasmacytic hepatitis

Kidney: Multifocal, mild to moderate, acute to subacute granulomatous interstitial nephritis with suspect intralésional parasite eggs

Spleen: Multifocal, mild, acute to subacute, histiocytic and heterophilic splenitis with mild lymphoid hyperplasia.

Small intestine: marked, multifocal, subacute lymphoplasmacytic and histiocytic enteritis with secondary GALT-associated hyperplasia

COMMENTS

Penguin 1: the primary lesion here is the (likely fungal) air sacculitis - often caused by *Aspergillus* sp. This is a common lesion in birds, especially those immunosuppressed. There is also evidence here of a likely bacteria (?secondary to air sac infection) and systemic inflammatory response, and some GIT paracitism.

Penguin 2: The liver contains a locally extensive area of granulomatous to pyogranulomatous inflammation here. There is also significant paracitism

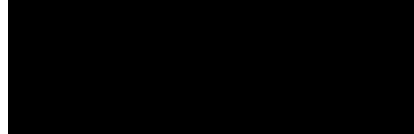


Specialist Pathologist

Validated by [REDACTED] Veterinary Pathologist.



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DOB: N/A

Collected: 01/07/25 09:00 Subm.No:

Lab No.:

Samples tested as received

All Tests Complete

SUMMARY DIAGNOSIS

Penguin 1
Probable mycotic air sacculitis

Penguin 2
Pyogranulomatous hepatitis
Probable renal Renicola sp. ova (trematode)

SUMMARY COMMENTS

Multiple processes contributed to morbidity for the two birds including probable mycotic air sacculitis, pyogranulomatous hepatitis (which could be bacterial or fungal in origin) and Renal trematodiasis.



Specialist Veterinary Anatomic Pathologist



Validated by

MOLECULAR DIAGNOSTICS

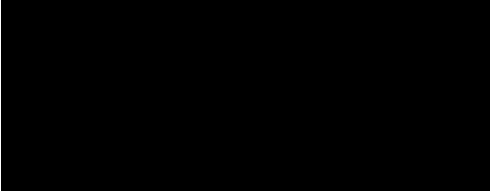
NEWCASTLE DISEASE VIRUS RNA PCR (REAL TIME REVERSE TRANSCRIPTASE)

Specimen type: Swabs in VTM

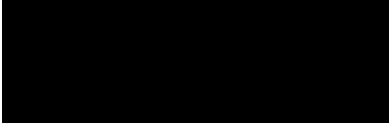
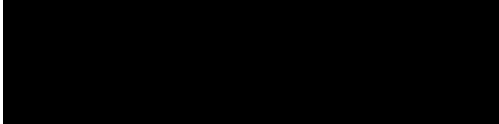
Number of specimens: 1

SPECIMEN ID	F Gene	M Gene	L Gene
POOL	Not detected	Not detected	Not detected

Validated by [REDACTED] Laboratory Scientist.



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Animal/s:
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DOB: N/A

Collected: 01/07/25 09:00 **Subm.No.:** [Redacted] **Lab No.:** [Redacted]

Samples tested as received All Tests Complete



CLINICAL HISTORY

Two little penguins submitted. One was washed up on sunday in front of Treleaven PL, Goolwa; and the other one this morning in front of the Victor Harbour Hotel, Victor Harbour. They both had punctured wounds but unable to determine it happened after death. To be submitted via [Redacted] tonight.

SAMPLES SUBMITTED

Two Little Penguins submitted.
 Bird 1 (1kg) = In front of Treleven Pl, Goolwa
 Bird 2 (800g) = In front of hotel victor, Victor Harbour

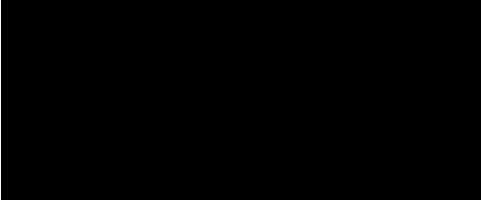
NECROPSY FINDINGS

Bird 1 = In front of Treleven Pl, Goolwa
 The carcass is moderately autolysed. The bird weighs 1kg.
 The bird is in good condition with adequate coverage over the keel bone. There is a 2cm diameter round, full thickness, puncture wound on the RIGHT lateral ventral coelomic region. There is no inflammation on the adjacent skin (likely post-mortem predation). The caudal coelomic organs can be visualised through this lesion.
 Within the cranial coelomic cavity and located next to the heart is a well demarcated, round, hard, yellow nodule. It is approximately 4 x 3 x 3cm, and it does not arise/associated with other organs within the cranial coelomic cavity. On cut section, the centre of the nodule is made out a hard, irregular, gritty, and yellow material which is easily removed from an outer layer of thickened fibrous connective tissue (suspect granuloma).
 There is moderate amounts of sand contamination, which corresponds to the previously described lesion was at the RIGHT lateral ventral coelomic cavity. The air sacs are clear. The gizzard is empty. The intestinal contents are brown and pasty.
 Bird 2 = In front of hotel victor, Victor Harbour
 The carcass is moderately-markedly autolysed. The bird weighs 800g.
 The bird is in good condition with adequate coverage over the keel bone. There is a 8cm oval and full thickness puncture wound at the LEFT lateral ventral coelomic cavity. There is no inflammation on the adjacent skin (likely post-mortem predation). The underlying ribs and

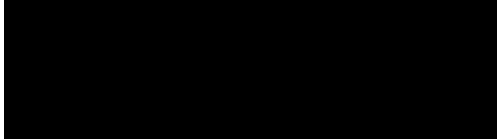
organs can be visualised through this lesion. The LEFT lateral coelomic organs are covered with moderate amounts of sand.

Within the liver is a single, round, white and well-demarcated lesion (suspect hepatitis).

The gizzard is empty. The caudal 1/2 intestines are stained green on the serosal surface (autolysis). The intestinal contents are opaque, pasty



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 Wild Birds

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DOB: N/A

Collected: 01/07/25 09:00 **Subm.No.:** [Redacted] **Lab No.:** [Redacted]

Samples tested as received All Tests Complete

and brown to green.

GROSS DIAGNOSIS

Bird 1 (In front of Treleven Pl, Goolwa):
 Cranial coelomic nodule: suspect granuloma
 Likely post-mortem predation

Bird 2 (In front of hotel victor, Victor Harbour):
 Liver: suspect hepatitis (bacterial vs fungal)
 Likely post-mortem predation

SAMPLES COLLECTED & TESTING

Both Penguins: tracheal and cloacal swabs in VTM -AI/ND PCR
 Both penguins: Fresh tissues in 50 mL pots (liver, intestines, kidney, lung) - stored at -80
 Both penguins: Fresh tissue in 5 mL tubes (liver, spleen, heart, kidney, brain, lung) - stored at -80
 Fresh sample of coelomic nodule (penguin 1) - stored at -80
 Swab of coelomic nodule (penguin 1) - stored at 4
 Fresh sample of liver lesion (penguin 1) - stored at -80
 Swab of liver lesion (penguin 1) - stored at 4
 Fixed tissues - Stored at room temperature- histopathology to follow

Comments: the mass found in the cavity of Bird 1 may be within the airsac, and be possibly a fungal granuloma- histopathology is to follow. Similarly histopathology will be done on bird 2 to better define the gross lesions- please await

[Redacted]
 Specialist Pathologist
 [Redacted]
 Resident

Validated by [Redacted] Veterinary Pathologist.

CASE MANAGEMENT DETAILS

Case Managed by:

Case Management Requested by:

Case Management Requested on: 02/07/25

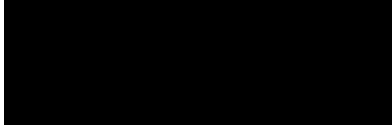


Case Details:

Found dead.



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Wild Birds

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DOB: N/A

Collected: 01/07/25 09:00 Subm.No: [Redacted] Lab No.: [Redacted]

Samples tested as received All Tests Complete

MOLECULAR DIAGNOSTICS

INFLUENZA A RNA PCR (REAL TIME REVERSE TRANSCRIPTASE)

Specimen type: Swabs in VTM

SPECIMEN ID Type A H5 H7

POOL Not detected

Validated by [Redacted] Laboratory Scientist.

CERTIFICATE OF ANALYSIS

Customer: [REDACTED]
 Address: [REDACTED]
 Contact: [REDACTED]

Submission Description: Biotoxin and Brevotoxins
 Sample Received Date: 11/12/2025
 Contract Number: [REDACTED]
 Client Order Number: [REDACTED]
 Program/Quote Reference: [REDACTED] Biotoxin and Brevotoxins

*Sample(s) analysed as received. Sampling date and time data supplied by the client. The document shall not be reproduced except in full.
 Additional information relating to this submission can be found in the sample receipt notification.
 This report supersedes any previous reports with this submission number.
 Many tests specify a holding time which gives the recommended timeframe by which a sample should be preserved/extracted and/or analysed after the sample is taken.
 Holding time information can be found on the AST website <https://analyticalservices.tas.gov.au/our-services/containers-samples-and-submissions>.
 Whilst every effort is made to analyse samples within these timeframes, situations can occur where this is not possible.
 Where a test has been conducted outside the recommended sample holding time this should be taken into account when interpreting results.*

The results in this report were authorised by:

Name	Position	Name	Position
[REDACTED]	Chemist	[REDACTED]	Section Head - Organic Chemistry

Test Information:

Method ID	Test Description	Date Commenced:
3411	Lipophilic Toxins in Shellfish by LC-MS/MS	02-02-2026
3411A	Brevotoxins in Shellfish by LC-MS/MS	02-02-2026
3416	PST in Biota by LC-MS/MS (Boundy Method)	02-02-2026



Sample Comments

Sample Number: 391441

3411A Brevetoxins in Shellfish by LC-MS/MS

The LOR has been increased due to limited sample available for testing

Sample Number: 391442

3411A Brevetoxins in Shellfish by LC-MS/MS

The LOR has been increased due to limited sample available for testing

Sample Number: 391443

3411A Brevetoxins in Shellfish by LC-MS/MS

The LOR has been increased due to limited sample available for testing

IS- Insufficient Sample

* NATA accreditation does not cover this result

Chemistry Test Results (Biota - Food)		Sample Description	Liver	Kidney	Lung	Spleen	Heart	Brain
Method ID	Analyte	Units	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00
			391438	391439	391440	391441	391442	391443
	AZA1	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	AZA2	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	AZA3	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	Domoic Acid	mg/kg WMB	<0.05*	<0.05*	*IS*	*IS*	*IS*	*IS*
	DTX1 Free	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	DTX1 Total	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	DTX2 Free	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	DTX2 Total	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
3411	GYM	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	Homo-YTX	mg/kg WMB	<0.02*	<0.02*	*IS*	*IS*	*IS*	*IS*
	OA Free	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	OA Total	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	PnTx-G	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	PTX2	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	SPX1	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	Total DST	OA eq. mg/kg	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
	YTX	mg/kg WMB	<0.01*	<0.01*	*IS*	*IS*	*IS*	*IS*
3411A	Brevetoxin 1	mg/kg WMB	<0.10*	<0.10*	<0.10*	<0.20*	<0.50*	<0.50*
	Brevetoxin 2	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.04*	<0.10*	<0.10*
	Brevetoxin 3	mg/kg WMB	<0.02*	<0.02*	<0.02*	<0.04*	<0.10*	<0.10*
	C1	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	C2	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	C3	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	C4	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
3416	dcGTX1	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	dcGTX2	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	dcGTX3	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	dcGTX4	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*

IS- Insufficient Sample

* NATA accreditation does not cover this result



Chemistry Test Results (Biota - Food)		Sample Description	Liver	Kidney	Lung	Spleen	Heart	Brain
		Sampled Date/ Time	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00	09/07/25 0:00
Method ID	Analyte	Units	391438	391439	391440	391441	391442	391443
3416	dcNEO	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	dcSTX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	doSTX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	GTX1	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	GTX2	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	GTX3	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	GTX4	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	GTX5	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	GTX6	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	NEO	STX.2HCl eq. mg/kg	<0.02*	<0.02*	<0.02*	*IS*	*IS*	*IS*
	STX	STX.2HCl eq. mg/kg	<0.01*	<0.01*	<0.01*	*IS*	*IS*	*IS*
	Total PST	STX.2HCl eq. mg/kg	<0.10*	<0.10*	<0.10*	*IS*	*IS*	*IS*

IS- Insufficient Sample

* NATA accreditation does not cover this result