AD HOC GROUP OF THE STATES PARTIES
TO THE CONVENTION ON THE PROHIBITION
OF THE DEVELOPMENT, PRODUCTION AND
STOCKPILING OF BACTERIOLOGICAL
(BIOLOGICAL) AND TOXIN WEAPONS
AND ON THEIR DESTRUCTION

BWC/AD HOC GROUP/19
17 July 1995

Original: ENGLISH

Second session
Geneva, 10-21 July 1995

LIST OF AGENTS*

Working Paper submitted by Brazil

Introduction

The requirements, character, capabilities and limitations of lists or compilations of biological agents, criteria for the identification of agents of concern, and the presentation of lists already established, were discussed on the FOC's BWC/CONF.III/VEREX/WP.175. Similarly, BWC/CONF.III/VEREX/NONE.23 and BWC/CONF.III/WP.119 introduce lists of agents, either from WP and/or NONE papers of VEREX, or established as part of international agreements, national laws and regulations.

The agents presented in such lists may represent the broad range of concern from different points of views, such as scientific, political, national, and international bodies, and of course many different criteria were taken into account to drawn these lists, but in general terms aiming the same purpose: identify biological agents that might be used as pathogens and be weaponized against human, animal or plants.

Description of the lists

The starting point for this exercise is the WP and NONE papers referring to lists of agents printed in the annex of FOC's BWC/CONF.III/WP.175, as follows: BWC/CONF.III/WP.2, 23, 34, 51, and BWC/CONF.III/NONE.7, 8, 11, 15, 25, 33. Besides these, there are lists established as parts of multilateral agreements (Annex IV of the Secretary General of the UN report on biological (bacteriological) agents that can be used against man, 1969 - UN), as well as parts of regional agreements (WEU-Treaty, 1954 - WEU), Hong Kong - HK (1992) and Australia Group - AG (Paris, 1992).

The majority of these lists present the agents divided in different classes: Viruses, Rickettsiae, Bacteria, Fungi, and Toxins, although some aggregate Rickettsiae and Bacteria,

---

* This WP is a revised version of a paper informally presented and discussed during VEREX IV session and another informal paper discussed during the Special Conference. The Brazilian Delegation acknowledges the revision of toxins nomenclature done by Prof. Betina and Dr. Woodfall for the written comments and suggestions.

such as BWC/CONF.III/NONE.33. Annex I of this paper presents the agents, in alphabetical order, cited in these lists, according to the nature of the citation, if in a VEREX Working or None Paper, or as part of a multilateral, plurilateral or regional agreement.

There are differences in nomenclature of agents among the sources, and some sources correlate diseases to agents. This is particularly true for viral agents/diseases, and for toxins many sources refer to the producing agent. Always, when possible, the scientific name of the agent is preferred, and for toxins their names and the producing organisms not always are cited. Many agents produce diseases in humans and animals. Agents causing diseases in plants are included, but they are cited in very few sources.

Analysis of the cited lists of agents

In 15 reference sources and a total of 148 agents, there are 55 Viruses, 7 Rickettsiae, 26 Bacteria, 9 Fungi, 50 Toxins, and 1 Protozoon, among 266 citations on Viruses, 40 on Rickettsiae, 162 on Bacteria, 18 on Fungi, 112 on Toxins, and 1 on Protozoon, totalling 599 citations. The mean number of citations per agent is about 4, increasing to 6.2 for Bacteria and decreasing to 1 for Protozoa (1 citation on 1 Protozoon).

The mean number of agents per reference source is about 10; for Viruses about 18, Rickettsiae 1.6, Bacteria 10.8, Fungi 1.2, Toxins 7.5, and 0.1 about other agents.

REFERENCE SOURCE	VIRUSES	RICKETTSIA	BACTERIA	FUNGI	TOXINS	TOTAL
WP/CONF.III/WP.2	18	1	10	0	5	**34**
WP/CONF.III/WP.23	17	3	9	1	16	**46**
WP/CONF.III/WP.34	18	3	10	0	9	**40**
WP/CONF.III/WP.51	24	6	12	4	2	**48**
WP/CONF.III/WP.7	21	5	15	3	2	**46**
WP/CONF.III/WP.8	3	1	7	0	16	**27**
WP/CONF.III/WP.11	0	0	0	0	23	**23**
WP/CONF.III/WP.15	7	5	13	3	2	**30**
WP/CONF.III/WP.16	22	1	3	0	0	**26**
WP/CONF.III/WP.25	18	2	13	0	9	**42**
WP/CONF.III/WP.33	36	4	18	6	10	**74**
WEU- TREATY, 1954	2	1	6	0	1	**10**
UN, 1969	8	2	10	1	0	**21**
AUSTRALIA GROUP,						

REFERENCE SOURCE	VIRUSES	RICKETTSIA	BACTERIA	FUNGI	TOXINS	TOTAL
1992	43	4	19	0	14	**80**
HONG KONG, 1992	29	2	17	0	13	**61**

The table above shows the number of agents by class mentioned in each reference source. The highest number of agents considered is 80 in the Australia Group list from 1992, and the lowest is 10 cited in the WEU-Treaty list from 1954. Fungi are the microorganisms least cited, and viruses are those most cited, particularly in the more recent lists. Except for the papers presenting national regulations (Germany - BWC/CONF.III/WP.34, Romania - BWC/CONF.III/NONE.25, and Norway -BWC/CONF.III/NONE.33), and the lists as part of international (plurilateral, multilateral and regional) agreements (WEU, UN, AG, HK), all the other lists are demonstrative, and some times focus only on one class of agents, like BWC/CONF.III/NONE.11 that mentions only toxins. **There is no list identical to any other**, even those more recently established, such as the lists from the Australia Group, Hong Kong, Romania (BWC/CONF.III/NONE.25), and Norway (BWC/CONF.III/NONE.33).

A first look at Annex I, where the agents are displayed in alphabetical order, according to class and the reference source, show three clusters of agents: one composed of agents cited by almost all sources, another cluster made up of agents cited very few times, and the third with no clear distinction.

The lists of Viruses

Viruses seem to be only recently considered as potential BW agents. There are only two of them cited by the WEU list from 1954, and 4 in the UN from 1969, compared to 43 and 29 by the AG and HK, respectively, both from 1992. There are 10 viruses mentioned only by one reference source, out of 55 cited viruses, and 16 viruses are mentioned by more than half of the 15 reference sources. Viruses like smallpox virus, yellow fever virus, dengue virus, Eastern and Western equine encephalitis viruses, Venezuelan encephalitis virus, and others have the same high rank position, independently from the weight criteria, reflecting the consistency of the citations.

The lists of Rickettsiae

The Rickettsiae class of agents are represented by 7 species, clearly divided in two clusters, where Rickettsia quintana, Rickettsia prowazekii, Rickettsia rickettsii, and Coxiella burnetti, are those which have almost the highest rank position, independently of the weight given.

The lists of Bacteria

Apparently, the distribution of citations about bacteria is more homogenous among the different sources, having only two species with 1 refeence; although, it is clear that

several species are heavily cited. If criterion 3 is taken as reference, Brucella abortus, Clostridium botulinum, Legionella pneumophila, Brucella suis, Shigella dysenteriae, Brucella melitensis, Salmonella typhi, Chlamydia psittaci, Pseudomonas pseudomallei, Vibrio cholerae, Pseudomonas mallei, Yersinia pestis, Bacillus anthracis, and Francisella tularensis, are those bacteria that represent the cluster with most citations.

The lists of Fungi

Fungi have 1.2 citations per reference source. The majority of the cited fungi are related to plant pathogens, 1/3 cited by a single reference source (BWC/CONF.III/NONE.33). Although that stands out, Coccidioides immitis, a human pathogen, is the only species most cited. WEU, AG, HK, Germany and Romania regulations do not mention fungi as a class agent of concern.

The lists of Toxins

Regarding toxins, it is important to notice that the WEU and UN lists do not mention toxins, and 30 out of the 50 cited toxins have only one citation, concentrated in three out of the 15 references sources. In the criterion 3 weighted list the highest ranked toxins are: cyanginosin (microcystin), tetanus toxin, cholera toxin, tyrichothecene mycotoxins, abrin, Shiga toxin, verotoxin, conotoxins, Clostridium perfringens toxin, saxitoxin, tetrodotoxin, ricin, Staphylococcus aureus toxins, and Clostridium botulinum neurotoxin A.

It is important to notice, also that Article 2, item 2 of the Chemical Weapons Convention on the definition of toxic chemicals, includes toxins “regardless of their origin or their method of production,” ricin and saxitoxin being on the list.

It might be understood that in the BTWC the toxin list be composed of the microorganisms able to synthesize or secrete the toxic agents.

The lists of other agents

Only Trypanosoma vivax is cited by a single reference source (BWC/CONF.III/NONE.51), probably as an example of a protozoan with large areas of natural occurrence in tropical countries, and high human case fatality rates.

Criteria for the establishment of the first list of agents

It is possible to construct a list of agents, based on those already established as part of national regulations, multilateral or regional agreements, or indicated in the specialized scientific literature. The criteria for inclusion of agents in such lists are mentioned on the FOC’s BWC/CONF.III/WP.175, that reflects the criteria of the existing lists presented in this paper. The importance of plant and animal agents is not adequately addressed, mainly because up to now such class of agents mentioned as part of import/export regulations, which were not included in the lists cited.

As referred before, the agents presented in this paper may represent the broad range of concern of States Parties and of many different points of views, such as scientific, political, national, and international bodies, but focusing same purpose: to identify biological agents that might be used as pathogens and be weaponized against human, animal or plants.

In view of this and in order to balance the such a broad range of concern by the States Parties, it is reasonable to accept that the first illustrative list should include all agents cited in the scientific-technical literature during VEREX and those established as parts of international agreements or national laws and regulations, divided into two categories: a **core list** composed by those cited at least twice, and an **alert list** of agents cited only by one reference source. In such case, the core list has 101 agents and the alert list 47 (see Annex).

The advantages of this approach are the following: it takes into account laws and policies of States Parties regarding biological weapons; preserves the different viewpoints due to political and ecological diversity among countries; and is in conformity with the designators already recognized as important background factors to select agents of concern.

The development of inclusion and exclusion criteria for agents, the decision about the application of the list to verification measures and the schedule for periodic revision must be considered.

Besides the criteria already established in the FOC's BWC/CONF.III/VEREX/WP.175, other examples of inclusion criteria could be:

a) Agents restricted by States Parties in the context of import and export regulations, mainly related to animal and plant pathogens;

b) Any new and/or modified agent causing a human, animal and plant disease described by the scientific literature, or officially reported by national or international authorities in charge of human or animal health or plant protection, which meets the criteria set out by BWC/CONF.III/VEREX/WP.175.

It is more difficult to establish exclusion criteria, since even when the stocks of one possible agent are destroyed, as proposed to smallpox virus, natural reservoirs might persist in nature and be used as a source for the agent, or the agent might be "rebuilt" using genetic techniques.

In relation to genetically modified organisms the vector and the parental organism/trait should be considered. If they are on the list or if the manipulated genetic trait or DNA/RNA sequence belongs to one of the agents in the list, the vector or derived engineered organism should be included.

The proper timing for regular revisions of the list could be the same as for the BWC Review Conferences or, exceptionally, whenever asked for by States Parties.

In principle, the list would apply to the following measures, if they are included in the compliance regime:

- Off-site: information monitoring, data exchange (notifications and declarations) auditing;

- On-site: interviewing, auditing, sampling and identification, medical examination, continuous monitoring.

The two main objections to establishing a list of agents could be impossibility of defining criteria and limitation of the scope of Article I. The first objection has been answered by several papers presented during VEREX. The second one deserves to be considered more carefully. The list must be illustrative and should not restrain the application of any specific measure. Inspections, for instance, should not be applicable only to those facilities working with the listed agents. Appropriate procedures would have to be devised for such cases.

The main purposes of the list of agents, as in the case of possible list of equipment, is providing concrete examples of types of agents that are relevant to the assessment of compliance with Article I, in order to help preparing national regulations, international cooperative mechanisms under the Convention and the some of the verification measures.

The illustrative list of agents would of course be subject to periodic revision according to a mechanism to be established among States Parties, in particular considering in deep animal and plant pathogens (taking into account information provided by the Food and Agriculture Organization and the International Office of Epizootics), the discussion of inclusion/exclusion criteria, and the formulation of operational aspects related to the application of the list to some verification measures.

Annex I

VIRUSES	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI-PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
African swine fever virus			+	+	+						+			+	
Avian influenza virus											+			+	
Bluetongue virus											+			+	
Chikungunya virus	+		+	+					+	+	+		+	+	+
Citrus greening disease				+											
Crimean-Congo haemorrhagic fever virus	+	+		+					+	+	+			+	+
Dengue virus	+	+	+	+	+	+		+	+	+	+		+	+	+
Eastern equine encephalitis virus	+	+	+	+	+			+	+	+	+		+	+	+
Equine pox virus	+														
Ebola virus		+	+	+					+	+	+			+	+
Foot and mouth virus	+		+	+	+						+			+	

VIRUSES	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI-PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Fowl plague virus					+										
Fowl smallpox virus	+														
Goat pox virus	+										+			+	
Hantaan virus		+							+	+	+			+	+
Hepatitis A virus				+	+			+	+						
Hepatitis B virus					+			+	+						
Herpes virus (Aujeszky's disease virus)											+			+	
Herpes B virus (Monkey)				+											
Hog cholera virus					+						+			+	
Influenza virus	+	+	+		+			+					+		
Japanese encephalitis virus	+	+			+				+		+			+	+
Junin virus		+	+	+					+	+	+			+	+
Kyasanur forest virus														+	+

VIRUSES	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI-PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Lassa fever virus		+	+	+					+	+	+			+	+
Louping ill virus														+	+
Lymphocytic choriomeningitis virus									+	+	+			+	+
Lyssa virus											+			+	+
Machupo virus		+	+	+					+	+	+			+	+
Marburg virus		+	+	+					+		+			+	+
Monkey pox virus			+							+	+			+	+
Murray Valley encephalitis virus														+	+
Newcastle disease virus				+	+						+			+	
Omsk haemorrhagic fever virus														+	+
Oropouche virus														+	+
Peste des petits ruminants virus											+			+	
Porcine enterovirus type 9											+			+	

VIRUSES	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Potato spindle tuber viroid*											+				
Powassan virus														+	+
Rift Valley Fever	+	+	+	+	+				+	+	+			+	+
Rinderpest virus			+		+						+	+		+	
Rocio virus														+	+
Smallpox virus	+	+	+	+	+	+		+	+	+	+	+	+	+	+
Sheep pox virus	+			+							+			+	
Southern bean mosaic virus				+											
St. Louis encephalitis virus	+				+				+					+	+
Sugar cane Fiji disease virus				+											
Teschen disease virus											+			+	

* Although viroids are a separate group of biological agents, consisting of infectious RNA molecules only, this viroid is included here for practical reasons.

VIRUSES	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI-PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Tick-borne encephalitis virus (Russian spring-summer encephalitis virus)	+	+			+				+	+	+		+	+	+
Venezuelan encephalitis virus	+	+	+	+	+				+	+	+		+	+	+
Vesicular exanthema virus					+										
Vesicular stomatitis virus					+						+			+	
Western equine encephalitis virus	+	+	+	+	+				+	+	+			+	+
White pox virus				+						+	+			+	+
Yellow fever virus (wild type)	+	+	+	+	+	+		+	+	+	+		+	+	+

RICKETTSIAE	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI-PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Coxiella burnetti	+	+	+	+	+			+	+	+	+	+	+	+	+
Erwinia stewartii				+											

RICKETTSIAE	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
Rickettsia mooseri				+	+			+							
Rickettsia prowazekii		+	+	+	+	+		+			+			+	
Rickettsia quintana (Rochalimaea quintana)										+	+			+	+
Rickettsia rickettsii		+	+	+	+			+			+		+	+	
Rickettsia tsutsugamushi				+	+			+							

FUNGI	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Coccidioides immitis		+		+	+			+					+		
Drechslera maydis (Helminthosporium maydis)											+				
Drechslera oryzae (Helminthosporium oryzae)											+				
Histoplasma capsulatum (incl. var duboisii)				+	+			+							
Puccinia graminis				+							+				

FUNGI	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Puccinia striiformis (Puccinia glumarum)											+				
Pyricularia oryzae				+							+				
Ustilago maydis											+				

BACTERIA	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Bacillus anthracis	+	+	+	+	+	+		+	+	+	+	+	+	+	+
Brucella abortus	+				+					+	+			+	+
Brucella melitensis		+		+	+					+	+	+	+	+	+
Brucella suis					+					+	+			+	+
Brucella spp	+		+			+		+							
Chlamydia psittaci		+	+		+			+		+	+	+	+	+	+

BACTERIA	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Clostridium botulinum										+	+			+	+
Clostridium perfringens														+	+
Clostridium tetani														+	+
Corynebacterium diphteriae					+			+							
Enterohaemorrhagic Escherichia coli, serotype 0157 and other verotoxin producing serotypes														+	+
Francisella tularensis (tularemia)	+	+	+	+	+	+		+	+	+	+	+	+	+	+
Legionella pneumophila		+	+	+										+	+
Mycobacterium tuberculosis					+			+							
Mycoplasma mycoides				+							+			+	
Nocardia asteroides					+			+							
Pseudomonas mallei	+	+	+	+	+	+		+		+	+	+	+	+	+
Pseudomonas pseudomallei	+	+	+	+	+	+		+		+	+		+	+	+
Pseudomonas solanacearum											+	+			

BACTERIA	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Salmonella typhi	+		+	+	+			+		+	+		+	+	+
Salmonella spp	+				+			+							
Shigella dysenteriae				+	+			+	+	+	+		+	+	+
Vibrio cholerae	+	+	+	+	+	+		+		+	+		+	+	+
Xanthomonas campestris pv citri											+				
Xanthomonas campestris pv oryzae											+				
Yersinia pestis	+	+	+	+	+	+		+		+	+	+	+	+	+
Yersinia pseudotuberculosis (mutated strain)				+							+			+	

TOXINS	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Abrin (A. precatorius)		+				+	+							+	+

TOXINS	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Aerolysin (Aeromonas hydrophila)						+									
Aflatoxins (Aspergillus flavus)						+									
Amilyn		+													
Ammodytoxin		+													
Anatoxin A (Anabaena flos-aquae)							+								
Anthrax toxins (A, R)						+									
Batrachotoxin (P. aurotactania)		+					+								
Brevetoxin		+													
Bungarotoxin (beta)		+													
Charybtotoxin		+													
Cholera toxin (Vibrio cholerae)						+	+							+	+
Ciguatoxin (G. javanicus)							+								
Clostridium perfringens (tox)	+						+			+	+			+	+

TOXINS	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Cobra toxin (Naja naja)						+									
Conotoxins		+								+	+			+	+
Corynebacterium diphteriae (tox)							+								
Cyanginosin (Microcystin) (Microcystis aeruginosa)			+				+				+			+	
D.A.S. (Diacetoxyscirpenol) (Fusarium equiseti)							+								
Dermophin		+													
Diamphotoxin		+													
Endothelin		+													
Enterotoxins (Staphylococcus aureus)	+	+	+	+	+	+	+	+		+	+			+	+
Erabutoxin (L. semifasciata)							+								
Exotoxin A (Pseudomonas aeruginosa)						+	+								
Latrotoxin		+													
Maitotoxin		+													

TOXINS	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Modeccin		+													
Neurotoxin A (Clostridium botulinum)	+	+	+	+	+	+	+	+		+	+	+		+	+
Neurotoxin (Shigella dysenteriae)		+					+								
Nivalenol* (Fusarium nivale)							+								
Notexin		+													
Noxiustoxin		+													
Palytoxin (P. toxia)		+					+								
Pertussigen (Bordetella pertussis)						+									
Ricin (Ricinus communis)	+	+	+			+	+			+	+			+	+
Roridin* (Myrothecium roridum)							+								
Satratoxin* (Stachybotrys atra)			+												

* Belongs to trichothecene mycotoxins.

TOXINS	BWC/CONF.III/ WP				BWC/CONF.III/NONE							MULTI- PLURILATERAL/ REGIONAL			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Saxitoxin (Ganyaulax catanella)		+	+			+	+			+	+			+	+
Scorpion toxins (alpha, beta)		+													
Shiga toxin										+	+			+	+
T2-toxin* (Fusarium tricinctum)			+			+	+								
Taipoxin		+													
Tetanus toxin (Clostridium tetani)						+								+	+
Tetrodotoxin (Spheroides rufripes)		+	+			+	+			+	+			+	+
Textilotoxin		+													
Toxin II (A. autralis hector)							+								
Trichothecene mycotoxins	+					+								+	+
Verotoxin										+	+			+	+
Verrucologen (Myrothecium verrucaria)			+				+								

OTHER BIOLOGICAL AGENTS	BWC/CONF.III/	BWC/CONF.III/NONE	MULTI-

	WP											**PLURILATERAL/ REGIONAL**			
	2	23	34	51	7	8	11	15	16	25	33	WEU	UN	AG	HK
Trypanosoma vivax				+											

CORE LIST

VIRUSES

1. African swine fever virus
2. Avian influenza virus
3. Bluetongue virus
4. Chikungunya virus
5. Crimean-Congo haemorrhagic fever virus
6. Dengue virus
7. Eastern equine encephalitis virus
8. Ebola virus
9. Foot and mouth virus
10. Goat pox virus
11. Hantaan virus
12. Hepatitis A virus
13. Hepatitis B virus
14. Herpes virus (Aujeszky's disease virus)
15. Hog cholera virus
16. Influenza virus
17. Japanese encephalitis virus
18. Junin virus
19. Kyasanur forest virus
20. Lassa fever virus
21. Louping ill virus
22. Lymphocytic choriomeningitis virus
23. Lyssa virus
24. Machupo virus
25. Marburg virus
26. Monkey pox virus
27. Murray Valley encephalitis virus
28. New Castle virus
29. Omsk haemorrhagic fever virus
30. Oropouche virus
31. Peste des petits ruminants virus
32. Porcine enterovirus type 9
33. Powassan virus
34. Rift Valley Fever
35. Rinderpest virus
36. Rocio virus
37. Sheep pox virus
38. Smallpox virus
39. St. Louis encephalitis virus
40. Teschen disease virus
41. Tick-borne encephalitis virus (Russian spring-summer encephalitis virus)
42. Venezuelan encephalitis virus
43. Vesicular stomatitis virus
44. Western equine encephalitis virus
45. White pox virus
46. Yellow fever virus (wild type)

BACTERIA

1. Bacillus anthracis
2. Brucella abortus
3. Brucella melitensis
4. Brucella spp
5. Brucella suis
6. Chlamydia psittaci
7. Clostridium botulinum
8. Clostridium perfringens
9. Clostridium tetani
10. Corynebacterium diphteriae
11. Enterohaemorrhagic Escherichia coli, serotype 0157 and other verotoxin
13. Legionella pneumophila
14. Mycobacterium tuberculosis
15. Mycoplasma mycoides
16. Nocardia asteroides
17. Pseudomonas mallei
18. Pseudomonas pseudomallei
19. Pseudomonas solanacearum
20. Salmonella spp
21. Salmonella typhi
22. Shigella dysenteriae
23. Vibrio cholerae
24. Yersinia pestis

producing serotypes 12. Francisella tularensis (tularemia)	25. Yersinia pseudotuberculosis (mutated strain)

R I C K E T T S I A E	
1. Coxiella burnetti 2. Rickettsia mooseri 3. Rickettsia prowazekii	4. Rickettsia quintana (Rochalimaea quintana) 5. Rickettsia rickettsii 6. Rickettsia tsutsugamushi

F U N G I	
1. Coccidioides immitis 2. Histoplasma capsulatum (incl. var duboisii)	3. Puccinia graminis 4. Pyricularia oryzae

T O X I N S	
1. Abrin (A. precatorius) 2. Batrachotoxin (P. aurotactania) 3. Cholera toxin (Vibrio cholerae) 4. Clostridium perfringens (tox) 5. Conotoxins 6. Cyanginosin (Microcystin) (Mycrocystis aeruginosa) 7. Enterotoxins (Staphylococcus aureus) 8. Exotoxin A (Pseudomonas aeruginosa) 9. Neurotoxin (Shigella dysenteriae) 10. Neurotoxin A (Clostridium botulinum)	11. Palytoxin (P. toxia) 12. Ricin (Ricinus communis) 13. Saxitoxin (Ganyaulax catanella) 14. Shiga toxin 15. T2-toxin* (Fusarium tricinctum) 16. Tetanus toxin (Clostridium tetani) 17. Tetrodotoxin (Spheroides rufripes) 18. Trichothecene mycotoxins 19. Verotoxin 20. Verrucologen (Myrothecium verrucaria)

* Belongs to trichothecene mycotoxins.

ALERT LIST

VIRUSES	
1. Citrus greening disease	6. Potato spindle tuber viroid*
2. Equine pox virus	7. Southern bean mosaic virus
3. Fowl plague virus	8. Sugar cane Fiji disease virus
4. Fowl smallpox virus	9. Vesicular exanthema virus
5. Herpes B virus (Monkey)	

BACTERIA	
1. Xanthomonas campestris pv citri	2. Xanthomonas campestris pv oryzae

RICKETTSIAE
1. Erwinia stewartii

FUNGI	
1. Drechslera maydis (Helminthosporium maydis)	3. Puccinia striiformis (Puccinia glumarum)
2. Drechslera oryzae (Helminthosporium oryzae)	4. Ustilago maydis

* Although viroids are a separate group of biological agents, consisting of infectious RNA molecules only, this viroid is included here for practical reasons.

TOXINS	
1. Aerolysin (Aeromonas hydrophila)	16. Endothelin
2. Aflatoxins (Aspergillus flavus)	17. Erabutoxin (L. semifasciata)
3. Amilyn	18. Latrotoxin
4. Ammodytoxin	19. Maitotoxin
5. Anatoxin A (Anabaena flos-aquae)	20. Modeccin
6. Anthrax toxins (A, R)	21. Nivalenol* (Fusarium nivale)
7. Brevetoxin	22. Notexin
8. Bungarotoxin (beta)	23. Noxiustoxin
9. Charybtotoxin	24. Pertussigen (Bordetella pertussis)
10. Ciguatoxin (G. javanicus)	25. Roridin* (Myrothecium roridum)
11. Cobra toxin (Naja naja)	26. Satratoxin* (Stachybotrys atra)
12. Corynebacterium diphteriae (tox)	27. Scorpion toxins (alpha, beta)
13. D.A.S. Diacetoxyscirpenol* (Fusarium equiseti)	28. Taipoxin
	29. Textilotoxin
14. Dermophin	30. Toxin II (A. autralis hector)
15. Diamphotoxin	

OTHER BIOLOGICAL AGENTS
1. Trypanosoma vivax

* Belongs to trichothecene mycotoxins.