

## INDOLES

The prototype drug in this subgroup (Table XVI) is compound S 219, lysergide (LSD), which produces dependence of the hallucinogen (LSD) type (see above). A tremendous literature on LSD exists which documents fully the dangers of abuse, which is now widespread in the USA, Canada, the United Kingdom, Australia and many western European countries (for references see Table XVI). LSD must be judged as a very dangerous substance which has no established therapeutic use.

Substances S 200–S 203, S 206, S 208, S 213–S 218 and S 220–S 222 are isomers or congeners of LSD. A number of these are much less potent than LSD in hallucinogenic effect or are not hallucinogenic at all (compounds S 203, S 213, S 216, S 217, S 220 and S 222) and accordingly carry a lesser degree of risk than LSD. None of these weak hallucinogens has been abused. Other compounds are all sufficiently potent to make it likely that they would be abused if available (S 200, S 201, S 206, S 208, S 214, S 218 and S 221).

Compounds S 202, S 207, S 209, S 223 and S 224 are derivatives of tryptamine. Dimethyltryptamine (S 209) is a short-acting hallucinogen which is effective only if smoked or injected. This compound has been extensively abused and an illicit market in dimethyltryptamine supplied by illegal synthesis has developed. Diethyltryptamine (S 207) is a similar drug but has not appeared in the illicit market. Psilocybine (S 224) and psilocin (S 223) are both potent hallucinogens that are effective orally as well as parenterally. Illicit traffic in psilocybine has occurred. Diethyltryptamine, psilocybine and psilocin accordingly must be judged to have high dependence potential.

Bufotenine (S 204) has been classed to be a hallucinogen but probably is not. Alpha-methyltryptamine (S 202) has been reported to have hallucinogenic properties but has not been abused. The dependence potential of these two compounds is therefore difficult to assess.

The remaining compounds, S 205, S 210, S 212 and S 225, are complex molecules that have been isolated from plants (see "Crude Plant Drugs", below) many of which are used ritualistically by primitive peoples. Their animal and human pharmacology have not been studied sufficiently to permit a definite judgement as to their relative dependence

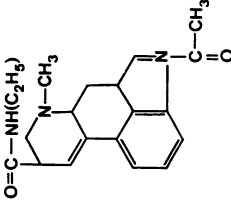
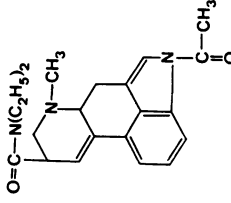
potentials. Ibogaine (S 212) has appeared in the illicit market in the USA.

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TABLE XVI. HALLUCINOGENS

INDOLE DERIVATIVES

1 No. of compound and formula (or chemical name)	2 Names <sup>a</sup>	3 Symptoms of Intoxication	4 Tolerance	5 Psychic dependence	6 Physical dependence	7 Pharmaco- logical notes <sup>b</sup>	8 Major dangers of abuse	9 Abuse- potential rating	10 References
<b>S 200</b> 	None; ALA-10		No Information	Possible	Improbable	No legitimate production; 1/15th as potent as LSD	Like LSD if dose high	High if available	64
(+)-1-acetyl-N-monoethyl lysergic acid amide									
<b>S 201</b> 	None; ALD-52		No Information	Probable	Improbable	No legitimate production; Equipotent with LSD; Same dangers	Like LSD if dose high	High if available	64
(+)-1-acetyl-N,N-diethyl lysergic acid amide									

<sup>a</sup> International Nonproprietary Name proposed by the World Health Organization, if any, or other nonproprietary name, if any; if there is no nonproprietary name, the main entry in the *Subsida Pharmaceutica Index Nominum* or in the *Merck Index* or other generally accepted name. "None" indicates that an International Nonproprietary Name has not been proposed so far. The following abbreviations show the source of the name used: BAN = British Approved Name; DCF = Dénomination commune française; IN = *Subsida Pharmaceutica Index Nominum*; MI = *Merck Index*, 8th ed.; NFN = Nordisk Farmakopéaevn.

<sup>b</sup> Current therapeutic use and indications.

TABLE XVI. HALLUCINOGENS

INDOLE DERIVATIVES (continued)

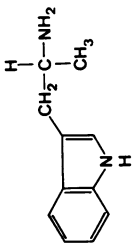
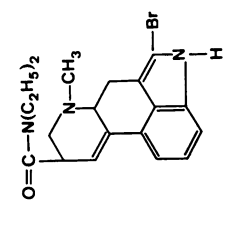
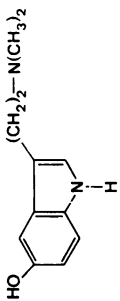
1	2	3	4	5	6	7	8	9	10
No. of compound and formula (or chemical name)	Names <sup>a</sup>	Symptoms of Intoxication	Tolerance	Psychic dependence	Physical dependence	Pharmacological notes <sup>b</sup>	Major dangers of abuse	Abuse-potential rating	References
<b>S 202</b>  $\alpha$ -methyltryptamine	None; AMT	Alterations in mood; Euphoria; dysphoria; Alterations in perception; Hallucinations; Depersonalization; Delayed onset	Unknown	Probable	Improbable	No legitimate production	Panic states; Schizophrenic reactions; Suicides; Precipitation of psychosis	High	—
<b>S 203</b>  (+)-2-bromo- <i>N,N</i> -diethyl lysergic acid amide	None; BOL-148		Confers cross-tolerance to LSD	Improbable	Improbable	No legitimate production; Less than 1/85th as potent as LSD	Weak drug; Short course	Low	—
<b>S 204</b> <sup>N</sup>  3-[2(dimethylamino)ethyl]indol-5-ol; 5-hydroxydimethyltryptamine	None; Bufotenine (MI)	Probably not hallucinogenic; Cardiovascular effects	No information	Improbable	Improbable	Dangerous	Cardiac arrhythmia	Unknown	64, 319, 327

TABLE XVI. HALLUCINOGENS

INDOLE DERIVATIVES (continued)

1 No. of compound and formula (or chemical name)	2 Names <sup>a</sup>	3 Symptoms of intoxication	4 Tolerance	5 Psychic dependence	6 Physical dependence	7 Pharmaco- logical notes <sup>b</sup>	8 Major dangers of abuse	9 Abuse- potential rating	10 References
<p><b>S 205</b></p> <p>6ac-aporphin-11-ol,10-methoxy-1,2-(methylenedioxy)</p>	<p>None; Bulbocapnine (MI)</p>	<p>Not too well charac- terized; Said to be a hallucinogen</p>	<p>Unknown</p>	<p>Unknown</p>	<p>Unknown</p>	<p>No longer used</p>	<p>Unknown</p>	<p>Unknown</p>	<p>64, 328</p>
<p><b>S 206</b></p> <p>(+)-N,N-dimethylamino lysergic acid amide</p>	<p>None; DAM-57</p>		<p>Unknown</p>	<p>Possible</p>	<p>Unknown</p>	<p>No legitimate production; 1/10th as potent as LSD</p>	<p>Could be like LSD if dose high</p>	<p>High if available</p>	<p>64, 304</p>
<p><b>S 207</b></p> <p>N,N-diethyltryptamine</p>	<p>None; DET</p>	<p>Alterations in mood; Euphoria; dysphoria; Alterations in perception; Hallucina- tions; Depersonal- ization</p>	<p>Unknown</p>	<p>Yes</p>	<p>Improbable</p>	<p>No legitimate production</p>	<p>Panic states; Schizo- phreniform reactions; Suicides; Precipitation of psychosis</p>	<p>High</p>	<p>64</p>

TABLE XVI. HALLUCINOGENS

INDOLE DERIVATIVES (continued)

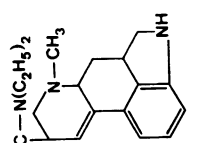
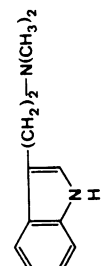
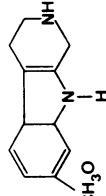
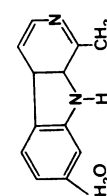
1 No. of compound and formula (or chemical name)	2 Names $\alpha$	3 Symptoms of Intoxication	4 Tolerance	5 Psychic dependence	6 Physical dependence	7 Pharmaco- logical notes $\beta$	8 Major dangers of abuse	9 Abuse- potential rating	10 References
<b>S 208</b> 	None; 2,3-DH-LSD		No Information	Possible	Improbable	No legitimate production; 1/6th as potent as LSD	Like LSD if dose high	High if available	322
<b>S 209</b> 	None; DMT	Alterations in mood; Euphoria- dysphoria; Alterations in perception; Hallucina- tions; Depersonal- ization	Unknown; Cross- tolerance with LSD	Yes	No	None; No legitimate production	Panic states; Schizo- phreniform reactions; Suicides; Precipitation of psychosis	High	342, 343, 348
<b>S 210</b> 	None; Harmaline		Unknown	Unknown	Unknown	Not well charac- terized; Said to be a hallucinogen	Unknown	Unknown	64, 338
<b>S 211</b> 	None; Harmine (banisterine, yagéine, etc.)	Drowsiness; Cyclical confused states	Unknown	Unknown	Unknown	No approved use; Not well charac- terized; MAO- inhibitor	Unknown	Unknown	64, 323, 340

TABLE XVI. HALLUCINOGENS

INDOLE DERIVATIVES (continued)

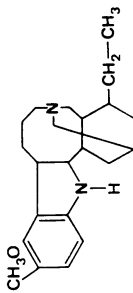
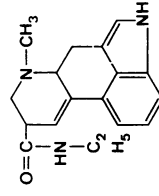
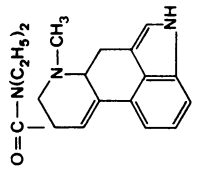
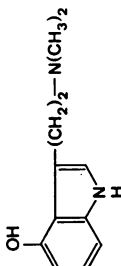
1	2	3	4	5	6	7	8	9	10
No. of compound and formula (or chemical name)	Names <sup>a</sup>	Symptoms of intoxication	Tolerance	Psychic dependence	Physical dependence	Pharmacological notes <sup>b</sup>	Major dangers of abuse	Abuse-potential rating	References
<b>S 212</b>  6,9-methano-5H-pyrido[1',2':1,2]azepino[4,5b]indole	None; Ibogaine	Not well characterized; Excitation; Epilepsy-like states	Unknown	Unknown	Unknown	Not used; Said to be a hallucinogen	Unknown	Low	64, 327, 344
<b>S 213</b> (+)-Isolysergic acid amide	None; Isolysergamide	Fatigue; Drowsiness; Headache; Not hallucinatory	No information	Improbable	Improbable	No legitimate production	Drowsiness	Very low	332
<b>S 214</b>  (+)-N-monoethyl lysergic acid amide	None; LAE-32	As S 219	No information	Possible	Improbable	No legitimate production; 1/20th as potent as LSD	Like LSD if dose high	High if available	64, 304
<b>S 215</b>  (+)-lysergic acid pyrrolidide; lysergic acid diethylamide pyrrolidate	None; LPD-824	As S 219	No information	Possible	Improbable	No legitimate production; 1/10th as potent as LSD	Like LSD if dose high	High if available	64, 304

TABLE XVI. HALLUCINOGENS

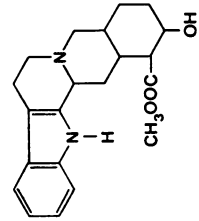
1 No. of compound and formula (or chemical name)	2 Names <sup>a</sup>	3 Symptoms of intoxication	4 Tolerance	5 Psychic dependence	6 Physical dependence	7 Pharmaco- logical notes <sup>b</sup>	8 Major dangers of abuse	9 Abuse- potential rating	10 References
<b>S 216</b>	None; (-)-LSD	As S 219	Unknown	Improbable	Unknown	No legitimate production; Less than 1/70th as potent as D-form	—	Low	—
(-)-N,N-diethyl lysergic acid amide									
<b>S 217</b>	None; (+)-isoLSD	As S 219	Unknown	Improbable	Unknown	No legitimate production; Less than 1/50th as potent as LSD-25	—	Low	—
(+)-N,N-diethyl isolysergic acid amide									
<b>S 218</b>	None; LSM-775	As S 219	No information	Possible	Improbable	No legitimate production; 1/10th as potent as LSD	Like LSD if dose high	High if available	64, 304
(+)-lysergic acid morpholide									
<b>S 219</b>	Lysergide (Syn.: LSD, LSD-25)	Alterations in mood; Euphoria- dysphoria; Alterations in sensory perception; Depersonal- ization; Entoptic hal- lucinations; Time hal- lucinations; Dilated pupils; Hyperactive reflexes	Yes	Yes	No	No legitimate production	Panic states; Schizo- phreniform states; Suicide; Precipitation of permanent psychosis	High	64, 304, 306, 307, 309, 313, 315, 318, 320- 322, 326, 327, 330, 331, 333- 337, 339, 341, 345, 346, 348, 351, 352, 369, 374
(+)-ergoline-8 $\beta$ -carboxamide,9,10- didehydro-N,N-diethyl-6-methyl; (+)-N,N-diethyl lysergamide									
<b>S 220</b>	None; MLA-74	As S 219	No information	Improbable	Improbable	No legitimate production; Less than 1/25 as potent as LSD	Weak drug	Low	64, 304
(+)-1-methyl-N-monoethyl lysergic acid amide									
<b>S 221</b>	None; MLD-41	As S 219	No information	Probable	Improbable	No legitimate production; 1/3rd as potent as LSD	Like LSD if dose high	High if available	64, 304
(+)-1-methyl-N,N-diethyl lysergic acid amide									

TABLE XVI. HALLUCINOGENS

INDOLE DERIVATIVES (concluded)

1 No. of compound and formula (or chemical name)	2 Names <sup>a</sup>	3 Symptoms of intoxication	4 Tolerance	5 Psychic dependence	6 Physical dependence	7 Pharmacological notes <sup>b</sup>	8 Major dangers of abuse	9 Abuse- potential rating	10 References
<b>S 222</b> (+)-1-methyl lysergic acid pyrrolidide	None; MPD-75	As S 219	No information	Possible	Improbable	No legitimate production; Less than 1/20th as potent as LSD	Weak drug; Short action	Low	64, 304
<b>S 223</b> 	None; Pilocin	Relatively non-toxic	No information	Probable	Improbable	LSD-like; 1/15th as potent (Dephos- phorylated psilocybine; Probably the active metabolite)	Same as LSD and psilocybine	High	64, 352
<b>S 224</b> 3-[2-dimethylamino)ethyl]indol-4-ol	Psilocybine	Relatively non-toxic	Yes; Cross- tolerance with LSD	Yes	No	No legitimate production; LSD-like; 1/15th as potent	Panic states; Schizo- phreniform reactions; Suicide; Precipitation of psychoses	High	64, 305, 310- 312, 316-318, 325, 327, 329, 330, 334, 335, 341, 352, 368
<b>S 225</b> 3-(2-dimethylaminoethyl)-indol-4-yl- dihydrogen phosphate	None; Yohimbine	Not well charac- terized;	Unknown	Unknown	Unknown	No legitimate production; Said to be a pure hallucinogen	Unknown	Unknown	64, 321, 328

Yohimban-16 $\alpha$ -carboxylic acid,  
17 $\alpha$ -hydroxy-methylester





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### PHENYLALKYLAMINES WITH METHOXY- SUBSTITUENTS ON THE PHENYL RING

The prototype drug of this class (Table XVII) is mescaline (S 226), a close chemical relative of amphetamine. It is the most active material found in peyote and was the first of the hallucinogens to be isolated, synthesized and investigated.<sup>353, 354, 356, 357, 366</sup> Though less potent, its effects are identical to those of LSD and crossed tolerance between mescaline and LSD has been proved.<sup>368, 369</sup>

An active illicit market exists. Mescaline is a drug of high abuse potential with no established therapeutic use.

A large number of phenylalkylamines with methoxy- and/or methylenedioxy- substituents on the phenyl ring have been synthesized<sup>358, 365</sup> and many more could be made. There seemed to be little point in listing all of these potential hallucinogens at this time. Two of them, compounds S 228 (TMA) and S 227 (STP or DOM), have been sufficiently characterized as having mescaline-like effects in man<sup>355, 358, 363-365</sup> so that they must be rated as having high dependence potential. In addition, S 227 (STP) has appeared in the illicit market.

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